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EDITORIAL.

WE are very pleased to announce that Messrs. KIRKALDY and LUCAS have kindly consented to join the Reference Committee of the 'Entomologist,' and will therefore become more intimately associated with the Journal. These gentlemen are already well known to our readers, and there is every reason to believe that their articles on British Rhynchota, Odonata, and Orthoptera, which have recently appeared in our pages, have greatly stimulated interest in these groups.

En passant we may remark that it is to be hoped that not only will insects of the orders adverted to receive increasing attention in the future, but that workers on the Coleoptera, Diptera, and Hymenoptera of this country may give us evidence of their activity.

The Editor wishes it to be understood that he is responsible for all unsigned matter published in the 'Entomologist.' All responsibility for articles and notes rests with their respective contributors, whose names or initials are always given. If the writer be a member of the Reference Committee, the views or opinions expressed by him are on his authority alone.

ON THE OCCURRENCE OF *COLIAS EDUSA* AND *C. HYALE*
IN 1900, AND THE RESULTS OF REARING THE VAR.
HELICE FROM *HELICE* OVA.

By F. W. FROHAWK, M.B.O.U., F.E.S.

THE first news I heard of respecting these butterflies during the past season was that on June 10th last, when my friend Mr. W. A. Cope forwarded me, for inspection, a living *C. hyale* male, which he had just captured near Cudham, Kent. A few days after this capture I heard of others having been seen in the south-eastern counties, principally Kent. I then predicted in the 'Field' that *C. hyale* would prove plentiful during the following August and September.

Excepting seeing one *C. edusa* on July 11th, in North Cornwall, I heard nothing more of either species until Aug. 15th, when I learnt that *C. hyale* was common in different parts of Kent, and that *C. edusa* was swarming in South Devon.

On Aug. 18th three friends and myself journeyed down to Sheerness, where we found *C. hyale* fairly plentiful, capturing over sixty specimens and about two dozen *C. edusa*, including one *helice*; the twenty *hyale* which I took consisted of eighteen males and two females. One female, being quite freshly emerged, I killed; the other, rather worn, I kept alive for ova, which, on the following day, deposited about forty, and continued depositing for one week, during which time I placed her upon five separate plants of clover. The number of eggs deposited upon the plants were 40, 80, 60, 42, and 14—total 236, which is about the full complement for this species. The eggs commenced hatching on Aug. 29th, and the larvæ are now (Nov. 17th) eighty days old, and hibernating. Some of them occasionally feed a very little, the majority remaining perfectly motionless (in this respect they precisely agree in habit to the *hyale* larvæ that I had under observation in the autumn of 1892, when I published notes on the earlier stages in the 'Entomologist,' then stating that *C. hyale* hibernated in the larval state). Although these larvæ were subjected to much heat and sunshine during September, they grew but slowly, while all the *helice* and *edusa* larvæ, which were kept under exactly similar conditions, fed up and pupated during the month. The *hyale* remained quite small, having only moulted twice by the time the *helice* and *edusa* were in pupæ. Another female *C. hyale*, captured by my wife at Addington, Surrey, on Sept. 7th (where we subsequently took others, as well as *C. edusa*) deposited 140 ova, the greater part of them being deposited on the 12th. We also captured about forty *C. hyale* near Broadstairs, Kent, between the 18th and 25th September, and also found *C. edusa* common, but

only observed three *helice*. The *edusa* varied much in condition, some being freshly emerged, while others very very worn; one pair I took in *coitu* on Sept. 22nd; the female was so much worn that it evidently had been flying for several days, but the male was, from its perfect condition, only just emerged. This worn female, and others kept alive for the purpose, deposited freely, and the worn one continued producing eggs until Oct. 3rd; the larvæ from them are now feeding, and will probably produce imagines about the end of December or early in January.

On Aug. 15th last I received a communication stating that *C. edusa* was swarming in South Devon, and that the var. *helice* was numerous. I thereupon wrote to my friend, Dr. Elliot, of Kingsbridge, expressing a wish to obtain living examples of *helice*, for the purpose of getting eggs and in the hope of rearing the variety. Upon receipt of my letter the doctor, most kindly, at once set out in search of specimens, and despatched five living *helice* to me on the 17th. These arrived at noon the next day, during my visit to Sheerness after *C. hyale*. Upon their arrival my wife found them to be in a very feeble state, owing to their long journey in the excessive heat then prevailing; she therefore fed them with sweetened water, and four of them survived. They were then placed upon a clover-plant, and one almost immediately commenced depositing. The following day I singled them out on to four separate plants of clover, and during the following eight days the four deposited in all between 850 and 900 eggs; these began to hatch on Aug. 24th, remaining only six days in the egg state, accountable to the hot weather. The first larva became full-fed and spun up on Sept. 19th; it pupated on the 21st, and the first imago emerged on Oct. 5th.

As will be seen by the following notes, the results attained out of the entire number reared are very interesting, as it shows the large proportion of *helice* produced from *helice* parents, which almost equal the normal females; in fact, exactly the same number of each emerged for several days, and it was only during the last few days of their emergence that the normal females gained slightly the lead.

As might be expected, the first specimens that emerged were males, many appearing before any females. The number of males bred amount to 302, of normal females 125, and *helice* 110, making a total of 537 of both sexes. It will be thus seen that the number of *helice* bred almost equals that of the normal females, and that the total number of females is 235 against 302 males. I had expected to breed a larger number of specimens, but from some mysterious cause quite 250 or 300 larvæ disappeared, as I had about 850 feeding when they were between the first and third moults (as I counted quite that number when changing their food-plants); but upon counting all the pupæ and the few larvæ

which I found from time to time dead, I was only able to account for about 580, instead of about 850. As the larvæ were carefully protected against earwigs, which are so destructive to young *Colias* larvæ, and not finding any trace of their remains, I am quite at a loss to understand what became of about 270; possibly cannibalism might account for some, but that seems hardly likely to be the case, otherwise I think I could not have failed noticing some trace of them, unless they fell from the plants and quickly decayed among the stems and earth, and thus escaped my notice.

However, the result attained is sufficiently satisfactory, as the *helice* form a most interesting and beautiful series, varying as they do in depth and tone of colour; the primaries vary in ground colour, from a mellow buffish orange to pure white. Between these two extreme forms every gradation of tone exists, even to clear lemon-yellow; there is also much variation in the secondaries; those with the deepest coloured primaries have the secondaries only very slightly greyer than a normal female; while the whitest specimens have delicate lilac-grey secondaries; two dozen specimens are more or less of the buffish orange form, being intermediate between the normal *edusa* female and a typical *helice*. The spots on the marginal borders vary a good deal in size and number; also does the central orange spot in the secondaries; in some it is intensely rich and deep in colour; in others it is light chrome-yellow, encircled with pale lemon-yellow. The under sides present most beautiful delicacy of colouring, especially the primaries, and one specimen has the whole of the ground colour of the primaries of a soft orange hue; the discoidal spots also vary much in size. Two of the *helice* are rather singular aberrations, one having the whole of the costal area of all four wings, from the median nervure to the apex, of a pale greyish buff, making the usual black of the apex and discoidal spots very faint, and the central secondary spots very pale yellow; the antennæ are also pale grey, instead of rosy red. The other specimen has the whole colouring very pale, the only part of the marginal band approaching to black is that at the anal angle of the primary, but the discoidal spots remain quite black.

The males bred vary a great deal in depth of ground colour, showing all degrees of strength, from a very deep rich orange, to the palest chrome-yellow; the marginal bands also vary in width, and those of the primaries are all more or less powdered with yellow scales; none have the borders anything like so black as in captured specimens; in many examples the yellow nervules run through the borders of all the wings; in one specimen they are so strongly marked that it gives the insect a strikingly different appearance. A large proportion of the males have the secondaries shot with a beautiful amethystine hue.

The normal females vary to much the same extent as the males in depth of the orange ground colouring. One rather fine aberration emerged on Oct. 12th, having the marginal bands of the primaries very broad, and the apical portion suffused to the discoidal spot, which is abnormally large; the spots in the borders are all but obliterated; it is of the same type of variation as the second figure in the second column represented on the coloured plate of *C. edusa* aberrations, published in the 'Entomologist,' March, 1878, but in my specimen the pattern is symmetrical, and the black borders of greater width.

I may add a few words relating to *C. edusa*. Of those I captured at Sheerness, Aug. 18th, six were males and one female; the latter started depositing the next day, and died on the 24th, after depositing about ninety eggs; these soon hatched, owing to the hot weather, and by the end of September most of the larvæ had pupated; from these an interesting series of imagines have emerged, showing about equal variation, as in the males and normal females bred from the *helice* ova. One female is an extremely handsome aberration as regards colour, having black secondaries shot with blue-green iridescence, and large light golden-yellow central spots and light golden-yellow primaries, which contrast in rich harmony with the dark secondaries; and the base of the primaries is also much darker than in normal examples.

November, 1900.

MISCELLANEA RHYNCHOTALIA.

By G. W. KIRKALDY, F.E.S.

ANISOPS FIEBERI, n. n.

= *A. niveus*, Fieb. 1851, nec (Fabr.).

The true *nivea*, Fabr., is, as I have previously shown (1899, Ann. Soc. Ent. France, p. 105), a small variety of *ciliata*, Fabr. The type is in the Fabrician Collection of the British Museum, and the species seems to be distributed over Central and Southern Africa, and Asia from Madras to China. The female of *fieberi* is scarcely distinguishable from that of *productus*, Fieb., but the male differs by the form of the cephalic projection. In *productus* this is long and triangular, apically pointed, somewhat roundedly; in *fieberi* it is shorter and distinctly truncate apically. *Fieberi* is distributed over British India; Celebes (Breddin, Mus. Halle).

ANISOPS BREDDINI, sp. n.

The species of *Anisops* are very variable within certain limits, and, as they are nearly always pallid, sordid whitish in colour

(individuals sometimes having an orange-red scutellum, and (occasionally) abdomen above), it is not easy to distinguish the closely allied species. The present species, which I dedicate to my friend Dr. Breddin, of Halle, and which is found in Celebes, Lura See bei Duri (Sarasin, viii. 95), can only be confused superficially with *vitreus*, Sign., from Madagascar. In both sexes, however, of *breddini* the eyes are actually contiguous intero-posteriorly; while in *vitreus*, even in the males, the interior margins of the eyes do not touch together. This character is constant in eight *breddini* and thirty-seven *vitreus* that I have examined. The type is in Coll. Breddin.

LOCALITIES.

Corixa affinis, Leach. Madeira; Zetland; (Mus. Perth and my collection).

C. lateralis, Leach (*hieroglyphica*, Duf.). Madeira (Mus. Perth and my collection).

MISCELLANEOUS NOTES.

Apache n. n. = *Ilynnis*, Burm. (nec Cuv.). Type, *rosea*, Burm.

Calmar n. n. = *Mæonia*, Stål (nec Dana, 1850). Type, *punctata*, Sign.

Colmadona n. n. = *Telmessus*, Stål (nec White, 1848). Type, *fenestratus*, Thunb.

Dikraneura, Hardy, 1850 = *Dicraneura* auctt.

Embolophora, Stål, 1859 = *Liburnia*, Stål, 1866.

Hoplophorion n. n. = *Hoplophora*, Germ. (nec Perty).

Kallipterygia n. subg. n. = *Pterygia*, Lap., 1832 (nec Boit., 1798 [subg. of *Notocera*, Am. Serv.] subg. Type, *macquarti*, Lap.

Kallitaxila n. n. = *Taxila*, Stål (nec Doubl., 1847). Type, *granulata*, Stål.

Montandonista n. subg. n. = *Belostoma*, subg. auct. [subg. of *Amorgius*, Stål]. In the typical subgenus the pronotum has very wide lateral margins; these are much narrower in subg. *Montandonista*.

Peggia n. n. = *Nebrissa*, Stål (nec Walk.). Type, *nitida*, Stål.

Temora n. n. = *Rudia*, Stål (nec Costa, 1869). Type, *dilutus*, Stål.

Tristan n. n. = *Scaphula*, Fairm. (nec Bens. 1834).

ON CERTAIN SEASONAL PHASES OF BUTTERFLIES OF THE GENUS *PRECIS*.

BY A. G. BUTLER, Ph.D.

SOME few years ago my friend Mr. G. A. K. Marshall expressed the opinion that *P. simia* of Wallengren would prove to be the wet-season form of *P. cuama* of Hewitson, at the same time regarding my *P. trimenii* as an intermediate variation of the same species.

My great objection to this association of butterflies, differing so greatly from each other as *P. simia* and *cuama*, was that in several collections which had reached me at various times, and from different parts of Eastern Africa, not only *P. simia* and *P. cuama*, but also *P. trimenii* were obtained at all seasons, and therefore could not strictly be regarded as seasonal forms. It also struck me that whereas *P. simia* and *P. cuama* have the outer margin of the primaries strongly angulated, and even sub-falcate below apex, the insect to which I gave the name of *trimenii* shows a much less developed angle to these wings. Another point which I noted was the strong rosy belt across the wings in *P. trimenii*, which is wholly wanting in *P. simia*, and is rather less developed though present in *P. cuama*.

Being now engaged upon a revision of the genus, I have been able to look thoroughly into this question, with the following interesting result:—

Under *P. cuama* I find that two quite distinct species have been confounded—*P. antilope*, Feisthamel, and *P. cuama*, Hewitson—both palpably dry phases. Comparing these carefully with *P. simia* and *P. trimenii*, I find that *P. simia* is undoubtedly the wet phase of *P. antilope*, which, as Prof. Aurivillius has pointed out, is more heavily marked above with black, and lacks the subapical white spots of *P. cuama*. It also differs in the shorter costa and less falcate outer margin of the primaries. *P. trimenii*, on the other hand, is without question the wet phase of *P. cuama*, between which we have intermediate examples serving completely to link them.

So far as our localities show, although all four forms occur in Southern and South-eastern Africa, *P. simia* = *antilope* has a more northerly range than *P. trimenii* = *cuama*. The fact that the phases are not confined to season in these species seems to me a strong argument against the indiscriminate use of the term "seasonal form" for these variations. As we know, the *P. sesamus* and *P. natalensis* forms of the eastern representative of *P. octavia* may be captured not only during the same month, but on the same day of the month, and therefore, though phases characteristic of certain seasons, are not strictly seasonal forms.

ORTHOGRAPHICAL AND CLASSICAL "EMENDATIONS" IN NOMENCLATURE.

By LOUIS B. PROUT, F.E.S.

So much has already been written on this thorny and very uninteresting subject that I ought to apologise for bringing it forward at all; but, as I am doing a good deal of work at entomological nomenclature, I feel it necessary to state succinctly the reasons which have led me to cast in my lot with the comparative few who reject "emendations" altogether (excepting in so far as to add in brackets "*recte*" so-and-so).

1. They are fatal to stability in nomenclature, giving occasion for endless controversy on matters of personal opinion and taste. *E. g.* because the name *siterata* of Hufnagel was not published with an etymology, and no satisfactory one could be found, it was seriously argued that it must be a misprint for "*literata*"; but what possible proof have we that this was so? And is *literata*, Don., to sink as a homonym to please these faddists? If anyone wants to see what intricacies originate from the admission of "emendations," let him turn to Proc. Ent. Soc. 1870, pp. v-viii.

2. It is sometimes very difficult to say what is absolutely the ideally classical form of a name, even when we know the root. See Ent. Mo. Mag. xxxvi. p. 194.

3. Names are names and nothing more, and insect names are no more subject to the rules of orthography than personal names. When we "classically amend" Mr. Smyth and Mr. Phillips, and turn Miss Clara George into Clarus George, we may reasonably begin to interfere with the insects.

4. It is absolutely illogical to allow names which are obviously mere combinations of letters with no meaning, such as the oft-quoted *Datana*, &c., of Walker, and yet to reject or alter others because their spelling does not indicate their meaning with sufficient accuracy.

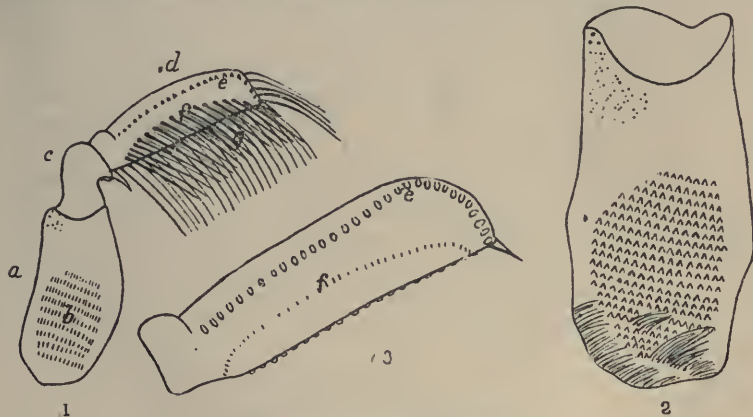
Of course, I am not advocating bad spelling or incorrect construction; the *Epichnoptorix*, &c., of Hübner are as great an eye-sore to me as to anyone, and I would conclude by urging nomenclators to act up to their best light, but at the same time pleading for the absolute inviolability of a name as first published; it is what I have long desired, but I had not the "courage of my convictions" until emboldened by the decided position which my friend Mr. Kirkaldy is taking (Entom. xxxiii. p. 26) in dealing with the Rhynchota.

THE STRIDULATION OF *CORIXA* [RHYNCHOTA].

By G. W. KIRKALDY, F.E.S.

IN the 'Irish Naturalist,' 1894, pp. 253-6, G. H. Carpenter discussed this interesting subject, and concluded that it was caused by the movement of the "comb" on the inner surface of the anterior tarsi across the face. *Corixa* does at times move the anterior tarsi across the face, but this, I believe, is merely to cleanse the latter (and possibly the former). The stridulatory area lies, in fact, on the inner surface of the anterior femora, close to the base. It consists of a very large number of minute sharp points, arranged regularly in more or less parallel rows. The stridulation is caused by one of the tarsi being drawn across the femur of the opposite leg. For stridulation to take place through the interaction of the tarsus and the face, the movement would have to be longitudinal (whereas it is actually transverse), the apical part of the face being strongly multicarinate transversely.*

This femoral area and the tarsal comb are not found in any females of *Corixa*, and not in the males of *Cymatia*, Flor, usually treated as a subgenus of *Corixa*. It therefore seems well to treat *Cymatia* as a distinct genus, as was done by Douglas and Scott. The whole apparatus can be seen very clearly in *C. geoffroyi*, Leach, from which the accompanying figures are taken.



EXPLANATION OF FIGURES.

Fig. 1. Anterior femur, tibia, and tarsus of *C. geoffroyi*. *a*, femur; *b*, stridulating area; *c*, tibia; *d*, tarsus; *e*, "comb"; *f* and *g*, two rows of bristly hairs. 2. Femur further enlarged. 3. Tarsus further enlarged. Letters as in fig. 1. (The two rows of bristles are not shown in fig. 3, and the figures are all a little diagrammatic for the sake of clearness.)

* It is true that this part of the face is also medianly carinate longitudinally, but it could scarcely be a stridulatory area adapted to the highly specialised tarsal apparatus, and moreover this form of the face is common to both sexes.

THE GENUS OF "*DIRCENNA BARRETTII*," DANNATT.

By PERCY I. LATHY.

MR. WALTER DANNATT (Entom. xxxiii. p. 299) describes and figures a new butterfly, belonging to the Neotropidæ, under the above name; he states that "this remarkable species, though believed by Dr. Staudinger to be a *Dircenna*, differs in some respects from hitherto known species in this genus."

A single male of this species has been for some time in Mr. Adams's collection, and when I arranged the Neotropidæ I placed it in the genus *Hymenitis*, next to *H. dircenna*, Feld.; on identifying it from Mr. Dannatt's figure and description, I compared it with several species of *Dircenna* and *Hymenitis*, and, though it differs slightly in neuration, I think it is in the latter genus that it should be placed, among *H. zavaletta*, Hew., and its allies.

In the neuration of the fore wing, *barrettii* differs from both *Dircenna* and *Hymenitis* in the cellular spur being emitted above lower discoidal nervule; this character, however, does not seem to be of great importance, as in long series of *H. zavaletta*, Hew., *H. zygia*, G. & S., and allied species, the position of cellular spur in relation to lower discoidal nervule shows considerable variation, and, though in no case is it actually above, in some specimens it is emitted from the same point. In the position of the middle median nervule, which at its origin is more than twice as far from lower median than upper, and in the lower median nervule being given off further from base than in *Dircenna*, it agrees with *Hymenitis*.

It is in the neuration of the hind wing that the relation to *Hymenitis* is most clearly seen; here the upper median nervule is shorter, the lower discoidal further from upper median, and upper angle of cell further from outer margin than in *Dircenna*. The præcostal nervule is forked, as in *H. zavaletta* and its allies; in *H. oto*, Hew., *H. libethris*, Feld., and similar species the præcostal is simple, as in *Dircenna*.

The character, however, which above all others makes me assign this species to *Hymenitis*, is the anastomosing of the upper discoidal nervule with the subcostal nervule near apex, thus forming a loop; this peculiar neuration is not found in any other genus of the Neotropidæ. The upper and middle median nervules are nearer together at their origin than in typical *Hymenitis*.

The locality of Mr. Adams's example is Chanchamayo, South-east Peru; it differs slightly from the type, inasmuch as there is a faint dark bar crossing middle of cell of fore wing. In this respect it approaches *H. dircenna*, Feld., but it may be easily

distinguished from that species by the absence of dark patch at anal angle of hind wing, and marginal markings below being without reddish brown.

Lynton Villa, Sydney Road, Enfield.

SYNOPSIS OF EXPERIMENTS IN HYBRIDIZATION AND TEMPERATURE MADE WITH LEPIDOPTERA UP TO THE END OF 1898.

BY PROF. DR. MAX STANDFUSS.

(Continued from vol. xxxiii. p. 348.)

If we count all the secondary hybrids together, they amount to two hundred and eighty-two, among which was the considerable number of twenty-seven gynandromorphic specimens, which were divided over at least twenty broods. When we think that, after careful calculation, the lamented and capable entomologist, A. Speyer, came to the conclusion that there was only one gynandromorphic specimen to every thirty thousand typical ones in nature, and, to quote a special case, during the eighty years during which my father and I have collected, only sixteen gynandromorphic specimens have been taken in the open or have been bred from material obtained thence, of which three were hermaphrodite—it would be absurd to regard this high percentage of gynandromorphic forms of these secondary hybrids as a mere matter of chance.

There must be a certain reason for this fact. Is it to be sought perhaps in their hybrid origin?

We know, from the fine work on gynandromorphic Macro-Lepidoptera of Max Wiskott, of Breslau, and O. Schultz, of Berlin, that, among all the hybrids thus far bred, there were only ten gynandromorphic specimens. To this must be added another, bred by me in 1897, from a pairing of *S. pavonia* ♂ × *pyri* ♀, the only¹⁰ one among more than two thousand primary hybrids, which I have as yet bred.

The percentage of gynandromorphic specimens among primary hybrids is without the slightest doubt infinitesimal, compared with their occurrence among secondary hybrids. It is, however, relatively higher than among individuals of pure origin, which must not be lost sight of.

The condition of all the female parents of these secondary

¹⁰ A further gynandromorphic primary *Saturnia* hybrid developed in 1898 from a crossing of *S. pavonia* ♂ × *spini* ♀. The number of primary hybrids bred by me is now increased to over four thousand, on account of the large hybridization experiments with the genera *Drepana* and *Pygæra*.

hybrids has certainly still less to do with the high percentage of gynandromorphic forms. These were entirely pure females, drawn direct from nature, which, according to experience, have no inclination to produce gynandromorphic offspring.

We are therefore limited, above all, to the condition of the male parents, that is, as to the quality of their genital products as the resulting factor.

This with all the more surety, since the genital products of the female hybrids of the same form had shown, even on microscopic examination, various degrees of degeneration, or, indeed, on microscopic examination, were found quite wanting. The authenticity of this idea is supported by the fact that the degree of fertility of these male hybrids is parallel with the degree of development of the egg germs and eggs in the ovaries of their sister females. The fertility of the hybrid male of the crossing *S. paronia* ♂ × *spini* ♀ was constantly higher than that of the male of the crossing *S. paronia* ♂ × *pyri* ♀, just as the females of the first hybrid have more highly developed egg germs and eggs than those of the second.

The condition of these male sexual products must, on their side, undoubtedly be regarded as a result of the hybrid origin of these forms, and depends to a large extent on the physiological affinity of the species hybridized. The lesser the divergence and difference of the crossed forms, the more normal will be the qualities of the sexual products of the resulting intermediate form.

As the sexual products of female hybrids have suffered perceptible damage and disturbance of their development through their hybrid origin, so also have the sexual products of the males; the latter is perceptibly proved by the frequent failure in function of these sexual products. Sometimes they do not act at all, sometimes result in individuals of abnormal, that is, gynandromorphic, build, and finally, sometimes at least, according to their outward appearance, in thoroughly normally developed males and females.

From these results it must be granted that there are factors which, passive in the normal male sexual products, cause the development of the resulting individual in the direction of a normal male or female build.

Moreover, we saw from the figures that the germ of the females of the two pure parent forms were by no means equally influenced by the male sexual products of the same hybrids.

The male hybrid *S. paronia* ♂ × *pyri* ♀ paired with *paronia* ♀ only produced brood in 33 per cent. of the pairings, which varied in fertility from 4 to 62 per cent.; the same male crossed with *pyri* ♀ was infertile in more than 60 per cent. of all pairings, and the fertile pairings only resulted in 1 per cent. offspring. Hinderances of a purely mechanical nature are in this case

highly improbable, and we are therefore limited to the physiological aspect.

The cause of this exceeding difference in fertility of the two above named secondary hybrids must be sought in the different degrees of physiological affinity between the *pavonia* ♀ and this hybrid male on the one hand, and between the *pyri* ♀ and the same hybrid male on the other, as regards the whole physiological build of this hybrid form.

The degree of fertility of a form stands now, doubtless, in direct connection with the percentage of gynandromorphic individuals in its offspring; the greater the fertility the smaller percentage of gynandromorphic forms, and *vice versa*.

In this sense the gynandromorphic forms are according to their number entirely dependent upon the species of female used—that is, they are dependent upon the degree of relationship that exists between this female to the parent male.

We must now come to the conclusion that also the female sexual products possess *in potentia* factors which influence the build of the brood in the sense of normal males and females.

Now, to go back a bit, to judge the percentage of gynandromorphism among primary hybrids. This, as we saw, was by no means high, but still higher than among individuals of pure origin.

The sexual products of both parents are in this case, of course, of normal quality, but not their relationship, their physiological affinity. It seems here actually to be the fact that the less the physiological affinity of the crossed pure species is, the higher the number of gynandromorphic individuals among the resulting hybrids, and *vice versa*. Among the hybrids of the crossing of *S. pavonia* ♂ $\times$ *pyri* ♀ five gynandromorphic individuals have been noted—three by Mr. W. Caspari (Wiesbaden), and two by me; whereas among the hybrids of the cross between *S. pavonia* ♂ $\times$ *spini* ♀, to the best of my knowledge, not a single gynandromorphic specimen is known.

The number of these two hybrids at present bred is about equal, and, from the results of our experiments, it must be concluded that the physiological affinity between *S. spini* and *S. pavonia* is greater than that of *S. pyri* and *pavonia*.

Further, that the degeneration and malformation of the egg-germs which these gynandromorphic forms have been shown by anatomical investigation to possess is directly connected with the appearance of secondary female sexual characters in male individuals, and *vice versa*; the occurrence of secondary male characters in female individuals has long been known to be a fact.

(To be continued.)

CATALOGUE OF THE LEPIDOPTERA OF IRELAND: SUPPLEMENTARY LIST.

BY W. F. DE VISMES KANE, M.A., M.R.I.A., F.E.S.

(Continued from vol. xxxiii. p. 333.)

PHOTHEDES CAPTIUNCULA, *Tr.* — Numerous about Ballyvaughan, Co. Clare, and much varied in colour, often wanting the rosy tinge, but always strongly marked and well defined. Tore Mt., Killarney, one.

AGROTIS SAUCIA, *Hb.* — Enniskillen (*A.*); Dromoland, Co. Clare, abundant (*Hon. E. O'Brien*).

A. CORTICEA, *Hb.* — Ballinskelligs Bay, and Castle Gregory, Kerry, abundant; Timoleague, Co. Cork (*R. D.*).

A. RIPE, *Hb.* — Again I am enabled to reinstate one of Birchall's doubtful species. Mr. W. Salvage informs me that he has taken a very reddish and well-marked form of *ripe* at Rossbeigh, Kerry.

A. CURSOREA, *Bork.* — Whitepark Bay, near Ballycastle, Co. Antrim, grey forms, but some with whitish stigmata and costa like those taken at Yarmouth; Rossbeigh, Kerry, very abundant and variable, some approaching Shetland examples (*W. Salvage*).

PANOLIS PINIPERDA, *Panz.* — Single specimens at Enniskillen (*P.*); Tempo, Sligo (*McC.*); also Timoleague, Co. Cork (*R. D.*). It is probable that this moth is getting a wider distribution of late years.

PACHNOBIA LEUCOGRAPHA, *Hb.* — Several taken at Clonbrock (*R. E. D.*).

TENIOCAMPA OPIMA, *Hb.* — Tempo, one; Enniskillen (*A.*); Armagh (*J.*).

T. MINIOSA, *Fb.* — Glenmalure, abundant, and Derrybawn, Co. Wicklow (*G. V. H.*).

T. MUNDA, *Esp.* — Delete the entry of Clonbrock as a locality.

T. PULVERULENTA, *Esp.* — Timoleague, Co. Cork, scarce (*R. D.*); Tempo, Enniskillen, one.

ANCHOCELIS HELVOLA (RUFINA), *L.* — One (banded form), Magilligan, Derry.

DIANTHÆCIA LUTEAGO var. *BARRETTII*, *Dbl.* — One taken at the cliffs of Coolin, Courtmaesherry Bay, Co. Cork, by Mr. R. Donovan, this summer. Characters similar to the Howth form.

D. CAPSOPHILA, *Dup.* — Timoleague, Co. Cork (*R. D.*).

HECATERA SERENA, *Fb.* — Two at Castle Bellingham; Howth, one; Timoleague, Co. Cork (*R. D.*).

DASYPOLIA TEMPLI, *Thnb.*—One larva at Clonmacnois.

CLEOCERIS VIMINALIS, *Fb.*—Near Sligo (*McC.*).

HADENA PROTEA, *Bork.*—One taken at Killynon, Westmeath, by Miss Reynell. The occurrence of single specimens in Galway and Westmeath of a moth so plentiful in its English habitats is a phenomenon more inexplicable than would be its total absence.

H. DISSIMILIS, *Knoch.*—Ardtully, Kenmare, Co. Kerry; Timoleague, Co. Cork (*R. D.*).

ASTEROSCOPIUS SPHINX, *Hufn.*—During the last few years this moth has been captured in various Irish localities, having been very numerous in 1896, from ten to twenty-eight specimens per night having been taken by Mr. Dillon and myself at Clonbrock. In that year it was numerous at Curraghmore, Co. Waterford (*Rev. W. Flemyng*); and its capture was recorded in the Co. Dublin at Dundrum and Templeogue (*Ir. Nat. v. 317*). Dromoland, Co. Clare (*Hon. E. O'Brien*).

CUCULLIA VERBASCI, *L.*—This species must be deleted. Prof. Hart's record was a clerical error for *C. chamomillæ*.

C. ABSINTHII, *L.*—One taken flying to lime blossom at Timoleague, Co. Cork, this year, by Mr. R. Donovan. A small example, but in fair condition.

PLUSIA BRACTEA, *Fb.*—Single examples have occurred at Drumreask, Monaghan, Castle Bellingham, and Belleisle, near Lisbellaw; and seventeen were taken by Mr. Allen at Enniskillen on honeysuckle.

P. INTERROGATIONIS, *L.*—Cloonee, near Kenmare (*R. E. D.*).

HELIOTHIS ARMIGERA, *Hb.*—One at Killynon, Westmeath, 1896 (*Miss Reynell*).

CHARICLEA UMBRA, *Hufn.*—Several at Howth (*G. V. H.*); Timoleague, Co. Cork (*R. D.*).

BANKIA ARGENTULA, *Hb.*—Clonbrock (*R. E. D.*).

HYDRELIA UNCULA, *Clerck.*—Dromoland, Co. Clare (*Hon. E. O'Brien*).

EUCLIDIA GLYPHICA, *L.*—I have met with this species plentifully all over the Burren of Clare, and south to Dromoland.

CATOCALA FRAXINI, *L.*—A specimen flew into the window of Mr. Thompson's house, Marlborough Street, Derry, September, 1896. Possibly imported by a ship.

BOMOLOCHA FONTIS, *Thnb.*—Dalyston, near Loughrea, Co. Galway. Var. *rufescens*, *Tutt*; and var. *suffusa*, *Tutt*. The same forms also occur in Kerry; Timoleague, Co. Cork (*R. D.*).

GEOMETRÆ.

VENILIA MACULARIA, *L.*—Near Corcomroe Abbey, Co. Clare ; Timoleague, Co. Cork (*R. D.*).

EURYMENE DOLABRARIA, *L.*—Timoleague, Co. Cork (*R. D.*).

AMPHIDASYS STRATARIA, *Hufn.*—Timoleague, Co. Cork (*R. D.*).

BOARMIA GEMMARIA, *Brahm.*—Timoleague, Co. Cork (*R. D.*).

B. CINCTARIA, *Schiff.*—Timoleague, Co. Cork (*R. D.*).

DASYDIA OBFUSCARIA, *Hb.*—One taken on ragwort at Dowros Head, Co. Donegal, in 1898, by G. P. Farren. Birchall's reference to its occurrence in Kerry may perhaps be substantiated by some future collector. The addition of this species and *Larentia flavicinctata* to our list is an additional link between the Irish and the Scottish fauna.

HYRIA MURICATA, *Hufn.*—Two at Cloonee, near Kenmare, by Mr. Dillon, rather larger and more suffused with purple than those he has taken in Galway. A few at Creagh, near Ballinrobe ; and at Clonmacnois.

ASTHENA CANDIDATA, *Schiff.*—Plentiful at Dromoland, Co. Clare.

ACIDALIA SUBSERICEATA, *Haw.*—Timoleague, Co. Cork (*R. D.*).

A. IMITARIA, *Hb.*—Timoleague, Co. Cork (*R. D.*).

BAPTA TEMERATA, *Hb.*—Sligo (*McC.*).

SELIDOSEMA ERICETARIA, *Vill.*—Recess, Connemara (*Wolfe*) ; Timoleague, Co. Cork (*R. D.*).

(To be continued.)

NOTES AND OBSERVATIONS.

LEUCANIA VITELLINA.—A single specimen of *Leucania vitellina* recorded from Romford (Entom. xxxiii. 306) appears to be an exceptional occurrence, and to mark the eastern range of the species in this country for the past season. It is, however, within my knowledge that, starting with a few specimens taken in the neighbourhood of Brighton, and pursuing a western course, the species has occurred in increasing numbers at several places to the extreme limit of the south coast.—ROBT. ADKIN ; Lewisham, Nov. 1900.

ABUNDANCE OF LYCÆNA ARGOLUS NEAR EASTBOURNE.—On visiting the ruined castles at Pevensey and Hurstmonceux in September last, I found *Lycæna argolus* flying about the tall ivy-covered walls, in the afternoon sunshine, in far greater numbers than I had ever before seen the species. I had previously noticed the butterfly flitting about the ivy patches in the town of Eastbourne, but not more commonly than I had

been accustomed to see it in recent years. A careful scrutiny of the ivy flower-bud heads, however, revealed the presence of eggs and recently vacated egg-shells in abnormal profusion; sufficiently good evidence that the butterflies also had been unusually abundant, but that I arrived on the scene too late to see them in their greatest numbers. I hear also that in the Abbots Wood district the butterfly was unprecedentedly common.—ROBT. ADKIN; Lewisham, Nov. 1900.

THE VANESSIDS IN 1900.—The pages of the entomological journals have contained, during the past few months, an unusual number of records of the observation or capture of rare species, among which are included several of *Vanessa antiopa*. It is, however, surprising how seldom reference is made to the more common, though from many points equally interesting, members of the group. *Vanessa (Cynthia) cardui*, *V. io*, *V. atalanta*, and even *V. polychloros*, are generally regarded as “such common species” that few entomologists appear to attach any importance to their occurrence or absence; but I venture to think that much useful information might be gathered from precise records of the abundance or otherwise of, and exact details regarding, the various species in particular districts, especially in a season like the past, which appears, in many respects, to have been a peculiar one. Such records, if concisely put, need occupy but little space, and yet convey a large amount of information.—R. ADKIN; Nov. 1900.

EREBIA GLACIALIS: A CORRECTION.—At the meeting of the Entomological Society of London held on October 17th last, I made some remarks on some specimens of *E. glacialis* then exhibited by Mr. H. Rowland-Brown. In the report of that meeting published in the December number of the ‘Entomologist’ (xxxiii. 359) I am made to say that “the darker specimens approached to the form of *E. melas* found in the neighbourhood of Cortina-di-Ampezzo.” This is not quite correct; what I said was that the darker specimens were like “the form that had been supposed to be *E. melas* found near Campiglio.” I refer to the examples first brought into notice by Mrs. Nicholl, and afterwards taken by Calberla, myself, and others, and proved by Calberla to be *E. glacialis*.—T. A. CHAPMAN; Betula, Reigate.

SOUNDS PRODUCED BY PUPÆ.—I reared about forty larvæ of *Thecla quercus*, and after they reached the pupal stage I placed them in a tin tobacco box, and, by chance, placed the lot upon a cardboard box. During the evening, whilst setting insects, I constantly heard a sound like the ticking of many watches, but with a kind of slight rasping as well. Upon opening the tin all was quiet, but, on gently tapping the tin, the sounds commenced again. I then placed the tin upon the table and tapped, when the same ticking was resumed, but it was not quite so audible. The position they first occupied acted as a kind of sounding-board; I could repeat the experiment any number of times. All the pupæ produced imagines, so the sounds could not have been made by parasites. About twenty pupæ of *Vanessa polychloros* fell from off the cover of a cardboard box which I had placed upon a chair. I experimented upon these by striking the floor sharply; the pupæ then made a very peculiar noise, a repeated tapping, and when I ceased

they did likewise. Walking across the room would also cause the pupæ to tap again.—J. H. FOWLER; Ringwood.

THE INSECT FAUNA OF HAMPSHIRE. — Mr. H. Goss's interesting article, in the new 'History of Hampshire,' on the Lepidoptera, is not quite exhaustive as to the species which have been found in Hampshire and the Isle of Wight. There is a favoured nook in the downs near Winchester where *Procris geryon* has been not unfrequently met with. *Sphinx convolvuli* has been often taken in gardens near Southampton. *Sesia sphegiformis* and *S. formiciformis* have been often taken near Basingstoke. I have found *Melanippe hastata* in some numbers in a wood near Southampton, and *Chesias obliquaria* frequently near the same locality where the broom abounds. *Leucania conigera* and *Miana fasciuncula* are not at all uncommon. *Cymatophora or* has been fairly frequently taken at sugar in a wood near Winchester. *Leucania extranea* was taken at sugar in a wood near Lyndhurst Road station in the autumn of 1897. *Laphygma exigua* has been taken more than once at Freshwater. I might add that *Callimorpha dominula* is abundant in the water meadows between Winchester and Twyford; that *Phibalapteryx tersata* and *vitalbata* are quite common in the chalk districts; and that I have taken many specimens of *Triphana subsequa* (though unfortunately generally in a worn condition) in Parnholt Wood, between Winchester and Romsey. Is Mr. Goss quite sure that *Thera simulata* occurs in the county? I believe it to be a northern species, though there are specimens of *T. variata* which may be very like it. I have collected now for many years in this neighbourhood, but have never come across *Ennomos fuscantaria* (though I have bred it from ova sent me from Yorkshire), and have never heard that it "is common in the neighbourhood of Southampton."—J. C. MOBERLY; Woodlands, Basset, Southampton, Dec. 4th, 1900.

SCALES IN LYCÆNA. — Köhler discusses the battledore scales in *Lycæna* (1900 Zool. Jahrb. xiii. 247–58; 1 Plate and 6 figs.), and regards them as sexual scent-scales. He combats Kenuel's conclusions, and asserts that they are not degenerating structures.—G. W. KIRKALDY.

VANESSA C-ALBUM IN IRELAND.—Up to the present time there has been no satisfactory proof of the occurrence of this butterfly in Ireland. Birchall, it is true, gave a record of it from Powerscourt (E. M. M. 1st series, viii. p. 6), but Mr. W. F. de V. Kane has shown (Entom. xxvii. p. 17) that this record was unreliable. I have now the pleasure of putting on record what is, I believe, an undoubted instance of its occurrence in this country. I have submitted the matter to Mr. Kane, and he appears to be satisfied. Last month the Rev. C. L. Garnett, Rector of Ardtrea, Stewartstown, Co. Tyrone, was on a visit in this neighbourhood, and came to have a look at my collection. In the course of conversation he mentioned that he had met with *V. c-album* in Ireland. I asked for a detailed account, which he very kindly gave. Unfortunately Mr. Garnett is not sure of the year, but it was several years ago. This is his account:—"It was about one and a half miles from Malahide on the Dublin road; July or August. I could not be mistaken, as I saw the creature settled, and it basked in the sun for a

time with its wings well spread. I made a bad shot in trying to catch it, and it made off in a very rapid manner indeed." Of course this was a case of migration, and it is a great pity Mr. Garnett cannot fix the year, as then there would be a possibility of tracing the origin of the insect, whether from abundance in England or on the continent.—W. F. JOHNSON; Acton Glebe, Poyntypass, Nov. 16th, 1900.

CAPTURES AND FIELD REPORTS.

COLIAS EDUSA AND *C. HYALE* IN 1900. — I captured several of the former and one of the latter here early in September, and took both species at Needham Market, and saw them near Aldeburgh, Woodbridge, Saxmundham, and Dunwich, in Suffolk, during the same month.—GERVASE F. MATHEW; Dovercourt, Essex, Dec. 10th, 1900.

Considering the abundance of *C. hyale* in England this year, a note on its appearance in the Rhine Valley may be interesting. I saw the first one on Aug. 2nd, careering over a wet meadow, on the slopes of the Taunus Hills, near Wiesbaden. On the 7th I saw several on a lucerne field, and took four close to Wiesbaden. On Aug. 12th we took the species again, at Braunfels, in the valley of the Lahn, near Wetzlar, and from that date till the 21st of the month we noted it daily there. On the whole, however, I should not call it abundant in that district this year, and *C. edusa* was entirely absent. Other butterflies were very numerous, but of these I hope to send you notes later.—ALFRED SICH; 65, Barrowgate Road, Chiswick, Nov. 20th, 1900.

In answer to your enquiry as to the northern distribution of *C. edusa*, I may say that I noticed a few females flying on the low cliffs at Criccieth, North Wales, during the early part of July last.—E. B. NEVINSON; 3, Tedworth Square, Chelsea, S.W.

COLIAS EDUSA AND *C. HYALE* IN YORKSHIRE, 1900. — Two males, Skipwith (Ash); Pocklington (Leadman); Ripon (Watts); two males Easingwold (Walker); two males and one female, Clifton-York (Hawkins); Rotherham (Bloor); one specimen in lane near Wadworth Wood (C. E. Young); Shipley Glen, Bradford (Booth and Beanland); "more plentiful in the Hull neighbourhood than since 1887; one collector took over fifty specimens in one day near Beverley, and some three dozen were seen in a clover-field, on the Humber-bank, by another; also odd specimens in the town (Boult); a specimen captured on Aug. 16th, near Guisborough, by the Rev. C. M. Withington, of Great Ayton; one seen in Grange Road, Middlesborough, on Sept. 10th, by Mr. C. Milburn; another seen in a clover-field near Middlesborough, on Sept. 12th, by Mr. Elgee"; sixteen specimens obtained on the Newbald Road, Beverley (Lowther); several specimens, one on the south cliff, Sept. 25th, by Mr. Gyngell, Scarborough (Lownsboro). One example of the var. *helice* was taken on the Yorkshire coast (Stevens). *C. hyale*, Bridlington (Corbett), Aug. 25th; Ripon (Fawcett); Beverley (Lowther); seen at Redcar, Middlesborough, and Newton-under-Roseberry, Sept. 13th (Sachse); one taken by a friend, on a privet hedge, at 8.45 a.m., near Hull (Cauldwell).—W. HEWETT; 12, Howard Street, York.

COLIAS EDUSA AND *C. HYALE* IN HAMPSHIRE.—On Aug. 25th I captured *C. hyale* at Fort Cumberland, near Portsmouth, on a grassy bank

close to the sea-shore. Another specimen was captured by me on Sept. 6th, at Gurnard, near Cowes, Isle of Wight. It was flying very slowly along the shore, and was not difficult to net. Immediately after this capture I saw yet another specimen, but was not fortunate enough to secure it, as it was flying too fast. *C. edusa* was in profusion this year in the Isle of Wight, and also on Portsdown Hill. At Hayling Island, near Portsmouth, *C. edusa* was abundant, and I saw *C. hyale* there also—EDMUND WINDER; 108, Lawrence Road, Southsea, Nov. 28th.

COLIAS EDUSA IN OCTOBER, 1900.—On Oct. 19th I took a female *C. edusa*, in the garden of a house on the cliff-front at Bournemouth, and on the 24th of the same month the species was flying in some numbers on the sides of both the east and west cliffs at the same place, but, owing to the difficult nature of the ground, I was only able to secure one specimen—a male. Both this latter specimen and the one taken in the garden above-mentioned are of interest from the fact that they were in absolutely perfect condition, notwithstanding the lateness of the season and the bad weather which we were then experiencing. I should say they had only emerged on their respective dates of capture. They are, moreover, considerably smaller than the usual size, and particularly well marked, especially the female. From this I am inclined to think that they represent a second autumnal brood. I may add that I saw no *C. hyale* at Bournemouth.—H. AINSLIE HILL; 9, Addison Mansions, Kensington, W.

COLIAS HYALE.—Three worn specimens captured by a youth in Birchington Marshes, in mid-July, set us on the watch. The first fresh specimen was noticed Aug. 15th, and on the 17th I netted and pinned exactly fifty specimens in two hours. Afterwards I was content to look for varieties, but without success, as to size. The insects scattered and got worn so quickly that I doubt if they winter here.—J. P. BARRETT.

ACHERONTIA ATROPOS AND *VANESSA (CYNTHIA) CARDUI* IN SALOP.—In reply to your note in the December 'Entomologist,' I beg to state that *A. atropos* has occurred in several localities about this district during the present year. I had four full-fed larvæ brought to me, from which I have succeeded in rearing three perfect insects by forcing. I hear also that a collector in the neighbouring town of Whitchurch has obtained three larvæ, one of which I saw before its pupation. And in the neighbourhood of Market Drayton a large number of pupæ have been found by the potato-diggers, as many as a hundred being met with on one farm, though they did not find their way to me. I have also taken several fresh specimens of *V. cardui*.—CHAS. F. THORNEWILL; Calverhall Vicarage, Whitchurch, Salop, Dec. 14th, 1900.

ACHERONTIA ATROPOS IN KENDAL DISTRICT.—It might be of interest, to complete my note on *A. atropos* (Entom. xxxiii. 353), to add that four more males (the last of female proportions) have successfully emerged (all from larvæ I myself found), under gentle warming by the fire, on the following dates:—1st, Nov. 11th; 2nd, Nov. 12th; 3rd, Nov. 16th; 4th, Nov. 24th. All the specimens emerged between 8 and 12 p.m.—A. M. MOSS; 12, Greenside Kendal.

ACHERONTIA ATROPOS IN YORKSHIRE.—Hovingham, August (Worsley); Boston Spa, Aug. 19th (Prince); two larvæ, Ripon (Smith); fifteen larvæ, Beverley (Boyes); Keighley, Aug. 30th (Longton); an imago, Aug. 30th, Horsforth; larvæ, Netherton (White). The above records are from the

'Yorkshire Post,' whilst the following are what I have had sent me by many correspondents:—One imago at the electric light, St. Sampson's Square, York, Oct. 22nd (Hawkins); one larva, Benningborough (Hewett); larvæ at Goole (Roper), Bridlington (Hobson), Normanton (Townsend), Skipwith (Ash); one larva, Haxby (Thurgood). Several larvæ, Pocklington, one of these the finder had stuck a knife into, "to see if it was alive"; and another was cut into with a spade, "to see what it was like" (Hewett); plentiful all over the Hull district, one collector had eleven dozen larvæ sent from Kilnsea, at four shillings a dozen (Boulton); three larvæ, Stanley, near Wakefield; one larva, Newton-on-Ouse, near York (Hawkins); two larvæ, Pickering (Metcalf); "from August to October larvæ were frequently brought to me by potato-pickers; through forcing I have bred several imagines from these," Doncaster (Corbett); "some fifty larvæ and pupæ obtained at Beverley, four of which I secured myself" (Lowther); two larvæ, Sept. 21st, Kildale, and pupa, Nov. 3rd, Redcar (Schse); larva, Withernsea (Cauldwell); "one caught, Worsborough Bridge, June 18th; flew in at open bedroom window at night" (Whittaker); one imago taken at Scarborough, Aug. 4th; larvæ at Sherburn, Aug. 24th; at Broughton, Sept. 3rd (Lownsboro); one perfect insect in the spring, three larvæ in August, one pupa in September, all close to Ayton (Hey); four larvæ at Whitby (Halliday)—W. HEWETT; 12, Howard Street, York.

ACHERONTIA ATROPOS IN SCOTLAND.—Mr. A. A. Dalglish (Ann. of Scott. Nat. Hist. 1900, p. 250) records a specimen, taken in York Street, Glasgow, on Sept. 20th, and one taken off a beehive at Kilmarnock, on July 11th last. Mr. R. Service, in the same journal, records a larva of this species from near Dumfries, another from near Lockerbie, and a third example from Borgue, in Kirkcudbrightshire; all these were found in the latter part of August. A pupa was obtained on Sept. 20th, also near Dumfries.

CLEORA GLABRARIA IN SCOTLAND.—Eight specimens of this species are recorded by Mr. A. Elliott from Roxburgh. They were found on July 25th and 27th last, at rest on the trunks of Scotch fir. Mr. C. G. Barrett, who has seen the specimens, confirms their identity. (Ann. of Scott. Nat. Hist. 1900, p. 250.)

ENNOMOS AUTUMNARIA (TILIARIA).—I think this species is well naturalized here now, as it occurs every season. This autumn I captured two females, with few eggs left in them. The larva feeds up readily on the balsam poplar. Given a suitable summer next year, I expect the gas-lamp at my front door (which is in direct line with the North Foreland Light-house) will attract a fair series.—J. P. BARRETT; St. John's Villas, Margate.

COLLIX SPARSATA DOUBLE-BROODED.—For three years past I have met with imagos, more or less worn, in June, and twice, on going for the larvæ in August, took imagos in similar condition. This season was backward. On June 20th I captured about a score imagos, no traces of larvæ; on July 30th a few larvæ nearly full-fed, no imagos; on Aug. 25th another score of imagos, mostly fine, no larvæ; on Oct. 6th full-fed larvæ not uncommon.—J. P. BARRETT.

MACROGLOSSA STELLATARUM.—After being comparatively scarce for some years, the "humming-bird moth" seems well established, the larvæ having been obtainable wherever a bit of bedstraw grew in the autumn. During October six or seven fresh imagos have come into the house to hibernate; one is still hidden in my bedroom. but I have neither seen nor

heard of a specimen in the open. Is this the usual habit of the insect? J. P. BARRETT.

COREMIA QUADRIFASCIARIA AND MELANIPPE PROCELLATA IN ESSEX.—With reference to notes on the occurrence of these species in this county, in this year's 'Entomologist,' by the Rev. Gilbert H. Raynor and others, I may mention that I have taken the former on several occasions in this district, and once bred it, though I cannot remember where I took the larva, or what it was like. Of the latter, one was taken by one of my sons here, on July 30th. There is no chalk in the neighbourhood, nor is there any wild clematis within ten or twelve miles that I know of, though I have noticed it in a few gardens, and have some in my own.—GERVASE F. MATHEW; Dovercourt, Essex, Dec. 10th, 1900.

DASYCAMPA RUBIGINEA IN BERKSHIRE.—Whilst collecting insects at ivy-bloom, on Oct. 16th, at Padworth, my father, Mr. H. Garrett, took a fine and perfect specimen of *D. rubiginea*; he searched for more several nights after, but was unsuccessful in obtaining another specimen.—HENRY E. GARRETT; 3, Brewer's Green Mews, Victoria Street Westminster, S.W.

VANESSA ATALANTA, MACROGLOSSA STELLATARUM, AND ÆSCHNA MIXTA IN KILBURN.—On the morning of Oct. 1st *V. atalanta* and *V. urtica* were still on the wing, in the nursery garden close to the Kilburn and Brondesbury Met. Station, and captured by the proprietor. I also noticed a specimen of *M. stellatarum* darting in and out among the flowers there. On the morning of Oct. 9th *V. atalanta* and *Æ. mixta* were noticed by me in the vicinity of West End Midland Railway Station. This is only the second specimen of *Æ. mixta* that I have seen in this neighbourhood.—(Rev.) F. A. WALKER; Dun Mallard, Shoot-up-Hill, N.W., Oct. 9th, 1900.

VANESSA ATALANTA IN SCOTLAND.—According to Mr. R. Service (Ann. Scott. Nat. Hist.) this species was abundant in Solway last autumn, especially in gardens, in one of which, not far from Southernness, he counted over two hundred specimens.

CIRRHÆDIA XERAMPHELINA AND VAR. UNICOLOR IN NOTTS.—I took a good number of the above last August, and one of the females is a splendid variety. The fore wings are all of the same ground colour as the central band. The band on the hind margin is also a shade darker, and more of a purple tint. Two faint yellow lines mark where the central band should be. Is this rare insect subject to much variation?—A. SIMMONS; Rutland House, West Bridgford, Nottingham.

[The variety referred to above appears to be an example of var. *unicolor*, Staud. A few specimens of this form have been previously recorded from localities in the North of England, and we understand that it is of regular occurrence in the Isle of Man.—ED.]

XANTHIA GILVAGO IN THE BROMLEY DISTRICT.—During the first week in October last I took a fine specimen of *X. gilvago*, at sugar, in Barnett Wood, near here.—A. J. LAWRENCE; 8, Cross Road, Bromley Common, Kent, Nov. 8th, 1900.

PLUSIA GAMMA.—To-day has been beautifully bright and warm, and, while walking on the sea-wall about noon, I saw a moth fly in from the sea. It passed over my head and settled on a tuft of grass, and upon walking up to the spot I found it was a fine fresh-looking example of this common species. By the way, how does *gamma* pass the winter—in the perfect,

pupa, or egg state? I have often seen the larva quite small at the end of October.—GERVASE F. MATHEW; Dovercourt, Essex, Dec. 10th, 1900.

ACIDALIA CONTIGUARIA, *Hb.*, AT CRICCIETH.—I do not think that this locality has been recorded, but as this is the third year I have met with it there, it may fairly be said to have established itself some distance from its old haunts. The case-bearing larvæ of *Diplodoma marginepunctella*, St., were also taken in some numbers off the lichens growing on the rocks and stones in the field-walls at the same place.—E. B. NEVINSON; 3, Tedworth Square, Chelsea, S.W.

ODONATA AT LEE, KENT.—I captured *Lestes sponsa*, *Ischnura elegans*, and *Agriion puella* at Lee in August last.—F. M. B. CARR.

SPHINX CONVULVULI AT EASTBOURNE.—Whilst attending a concert at the Floral Hall at Eastbourne, one evening at the end of August last, I met a gentleman who was holding a live specimen of *S. convolvuli* between his finger and thumb. He told me that he had just knocked it down with his hat while it was flying to electric light in the garden.—R. ADKIN.

SPHINX CONVULVULI IN SCOTLAND.—Mr. R. Service (Ann. Scott. Nat. Hist. 1900, p. 248) states that a specimen of *S. convolvuli* was taken at Portpatrick, on Aug. 20th.

MIGRANTS.—Our proximity to the Continent gives a touch of excitement to sugaring (not often does the prize appear) as to what may turn up. I recollect rejoicing over one *Agrotis saucia* in Dulwich Wood; well, on Sept. 21st last, *A. saucia* was commoner here than I have ever seen *Xylophasia polyodon*. Last year, in same locality, I took six. *Leucania vitellina* has hovered about for twenty years past; this year we had five specimens and more seen, but not captured; *L. albipuncta* also turned up. *Aporia crataegi*: I had become afraid that this species had entirely disappeared from this neighbourhood, but lads with nets teach us something sometimes, and they have caught at least a dozen specimens in 1900.—J. P. BARRETT.

LATE AND EARLY DATES OF CERTAIN LEPIDOPTERA IN CORNWALL.—On Oct. 18th, 1897, I took *Polyommatus phloas*, *Pieris brassicæ*, *P. rapæ*, *Colias edusa* (two males), *Pyrameis cardui*, *Vanessa atalanta*, *Pararge egeria*, and *P. megæra*, all on one railway bank in a sheltered cutting; *C. edusa*, Nov. 9th, 1889; Oct. 18th, 1897; Oct. 26th, 1898; Nov. 16th, 1899. *Polyommatus phloas*: Oct. 18th, 1897; Nov. 3rd, 1900, the latter in beautiful condition and fairly strong in flight. *V. atalanta*, Oct. 18th, 1877; Nov. 4th, 1900; in strong flight and good condition. *V. io*: Feb. 12th, 1899, on the wing. *Macroglossa stellatarum*, Nov. 24th, 1899; Nov. 28th, 1900. *Arctia (Chelonia) caia*: Nov. 10th, 1899; emerged from pupæ in a cold outhouse, from larvæ taken Aug. 25th, and which pupated early in October. *Phlogophora meticulosa*: Nov. 3rd, 1900; larva of this species, Feb. 16th, 1898, and which pupated, and the imago emerged May 2nd, 1898; also a full-fed larva, Dec. 2nd, 1900, found feeding on chrysanthemum flowers in garden, and is now pupating.—W. A. ROLLASON; The White House, Truro, Dec. 10th, 1900.

NOTES FROM BRIGHOUSE.—*Macroglossa stellatarum* has been commonly taken in this district this year. *Plusia gamma* in extraordinary numbers. *P. chrysis* and *P. iota* have also been taken, not uncommonly. *Vanessa atalanta* and *V. urticæ* have been present in good numbers, as well as *Pieris*

brassicae. I may also mention that at 10.30 p.m., Aug. 2nd, a fine specimen of *M. stellatarum* came in at the open window of my bedroom, apparently attracted by the light. Is this anything unusual?—THOS. B. BLAKEBOROUGH; "Ashlea," Brighouse, Nov. 17th, 1900.

NOTES FROM BRODICK, ARRAN, N.B.—In reply to your note in the December number of the 'Entomologist,' as to the few reports of *Colias hyale* and *C. edusa* in the northern districts of England and Scotland, I may mention that I spent the month of August and the beginning of September at Brodick, Arran, N.B., and during that time I did not see a single specimen of either of these species. The following, however, were some of my captures:—*Argynnis aglaia*, *Nonagria fulva*, *Hydrécia nictitans*, *H. micacea*, *Charaas graminis*, *Polia chi*, *Mania maura*, *Larentia olivata*, *L. miata*, *Cidaria russata*, *M. tristata*, *Melanthia rubiginata*, *Anaitis plagiata*, *Choreutes scintillulana*, *Hedya paykulliana*, *Peronea schalleriana*, *P. comparana*, *Leptogramma (Oxygrapha) literana*, *Dictyoteryx contaminana*, *Pamphusia monticolana*, *Grapholitha (Calosetia) nigromaculana*, *Eupécilia angustana*, *Plutella cruciferarum*, *Cerostoma xylostella*, *Depressaria umbellana*, *Chelaria hübnereella*, *Pterophorus acanthoductylus*.—ARCHDALE SHARPIN; 23, Kimbolton Road, Bedford.

NOTES FROM SOMERSETSHIRE.—From August 9th to 17th I stayed with my friend Mr. W. W. Lane, at his house in Weston-super-Mare. Though the time was very much taken up with other things, I managed to do a little entomologising, of which the following is the result. *Pieris rapæ* and *napi* were of course common. In the woods at the back of the town I saw two *Argynnis paphia*, and also a lovely var. *valesina*, which was in perfect condition, but, alas, I was unarmed. In these woods, too, *Pararge egeria* and *Epinephele ianira* were both common. On the rough stony ground which fringes these woods I found *Vanessa io*, *atalanta*, *cardui* (the last of these seemed to come out just before I left), *Pararge megara*, *Polyommatus phleas*, *Lycæna icarus (alexis)*, and *L. argiolus* very plentiful. *Macroglossa stellatarum* was very common flying about in the sunshine. Some old poplar trunks in the Park were very badly bored by *Cossus ligniperda*. *Triphæna comes (orbona)* and *pronuba* were very common, while *Plusia gamma* was more plentiful close to the woods than was pleasant. We went to Cheddar to see the world-famed caverns, and, after having done this, we climbed the cliffs which border the roadside. Here I noticed the following:—*P. rapæ* and *napi*, *Vanessa io*, *Satyrus semele*, *Epinephele ianira*, *Lycæna astritrache (medon)*, and *Hesperia thauumas (linea)*; also one young larva of *Bombyx rubi* and three or four of *Euchelia jacobææ*. *Gonopteryx rhamni* and *E. tithonus* were common along the hedges, where I also found a few *Phalera bucephala* larvæ. Returning home, I found a male *Bombyx quereus* on Yatton Station platform. *Locusta viridissima* was very common at Weston-super-Mare among the raspberry canes in the garden, where, I am told, it established itself about three years ago.—OSCAR WHITTAKER; Morelands, Heaton, Bolton, August 21st, 1900.

THE SEASON OF 1900.—The season just passing has been again a good one for the Rhopalocera generally in localities I have visited. But I think the midsummer and autumn species have been on the whole more numerous than those of the spring or early summer. This seemed specially to be the case with *Euchloë cardamines* and *Argynnis euphrosyne*, both of which I did not notice so frequently in South Wales as in some seasons. In the month of May several days were cold in temperature, which may have had some

influence; and yet, on the other hand, *Lycæna argiolus* occurred in fair numbers as usual. Towards the end of June (28th) I noticed two specimens of *Colias edusa* in the valley of the Tawy, Carmarthenshire; and, again, one specimen in Montgomeryshire, in the Dovey Valley, on July 10th; a male specimen of *Euchloë cardamines* was taken on July 3rd in the same district. During this month *Argynnis aglaia* and *adippe* might frequently be met with. Larvæ of *Vanessa io* were very abundant; and later on the imagines began to appear frequently. *V. cardui* I have seen now and again throughout the summer, but never commonly; *atalanta*, however, has been most abundant during the autumn months. *Colias edusa*, I imagine the first of the new brood, I again saw in Montgomeryshire on August 12th; and during September, when in North Devon, it might frequently be turned up; and I have heard of *C. hyale* being found in several different localities, but I, personally, did not see a specimen. *Lycæna icarus*, second brood, was abundant in N. Devon; and *Polyommatus phlœas* fairly so. I saw a few specimens of *Macroglossa stellatarum* at the end of July in Wales, and occasionally later in the autumn in Devonshire, but not as it occurred last season; the last specimen noticed was on October 6th. Larvæ and pupæ of *Acherontia atropos* have been reported not unfrequently in parts of Somersetshire, but I have not heard of *Sphinx convolvuli*. Three larvæ of *Deilephila euphorbiæ* were reported to have been found near Cirencester, Gloucestershire, at the end of the month of August; two of them found by a lad just below the surface of the soil. The account appeared in the 'Gloucestershire Standard.' I am making enquiries respecting this find.—T. B. JEFFERYS; Bath, October, 1900.

NOTES FROM NORFOLK.—During the latter part of July and August I did some collecting in Norfolk, all the following insects being seen within a three-mile radius of Norwich. Sugar was fairly successful as regards the number of insects that turned up; these were:—*Thyatira detersa* (rather worn), *Dipterygia pinastri*, *Mamestra brassicæ*, *N. c-nigrum*, *N. plecta*, *Triphæna pronuba*, *T. fimbria* (mostly in poor condition), *T. orbona*, *T. ianthina*, *Amphipyra pyramidea*, *A. tragopogonis*, *Phlogophora meticulosa*, *Plusia gamma*, *Catocala nupta* (in splendid condition), *Dianthæcia cucubali*, *Agrotis suffusa*, *A. puta*, *Leucania pallens*, *Xylophasia polyodon*, *X. lithoxylea*, *Euplexia lucipara*, *Hypena rostralis*, *Gonopteryx libatrix*, *Acronycta megacephala*, and *Xanthia citrigo*. Light was rather a failure, only producing the following:—*Smerinthus populi*, *Philodonta palpina*, *Odonestis potatoaria* (one very dark male), *Triphæna pronuba*, *T. fimbria*, *Plusia gamma*, *Abraxas grossulariata*, *Lasiocampa quercifolia* (one very dissipated specimen), *Lithosia complanula*, *Cilix spinula*, and *Cerigo cytherea*. Larvæ I neglected, but somewhat casual hunting produced:—*Cerura vinula* (of which I found over twenty caterpillars in about three days, and could have probably collected more had I so wished), *Acronycta aceris* (one), *Smerinthus tiliæ* (one), and *Sphinx ligustri*.—W. T. HARRIS; 17, Micheldever Road, Lee.

NOTES FROM EASTBOURNE.—On June 9th I went to Eastbourne for three weeks. Although I arrived somewhat late in the evening, I got out my "apparatus," and started for a place called "Paradise," the only piece of wooded land near Eastbourne itself. The first thing that turned up was *Hepialus lupulinus*, a white var. of which occurred in swarms; besides these *Bapta taminata* was very common, *Melanthia ocellata* occurred sparingly, *Eupithecia vulgata* was common, and single specimens of *Agrotis*

ripæ, *Melanippe galiata*, *Coremia ferrugata*, *Cidaria russata*, and *Larentia pectinitaria* turned up. This ended my first evening, and I was somewhat disappointed with the prospects. June 10th. I did not get much work in. Besides *C. ferrugata*, *B. taminata*, and *H. lupulinus*, I took specimens of *Zonosoma (Ephyra) pumclaria*, *Apilates citraria* (one), *Lycæna bellargus* (common), *Syrichthus malvæ*, *Euclidia mi*, and *Cidaria corylata*, mostly at Beachy Head. June 11th. I got out before breakfast, and again went to Beachy Head. *L. bellargus* swarmed, as also did *L. icarus* and *L. minima*, and single specimens of *Melanippe subtristata* and *Eupithecia centaureata* turned up. Later, I trained to Hailsham, and walked thence to Polegate through Abbott's Wood. *Argynnis euphrosyne* was very common, and I was very much surprised to capture a specimen of *Melitæa athalia*, the only one I took. Besides these, *Melanippe montanata*, *Asthena candida*, *Adalia remutata*, *Cidaria corylata*, *Zonosoma porata*, *Cabera pusaria*, and *Iodis lactearia* were common; while single specimens of *Euchloë cardamines*, *Polyommatus phlœas*, *Strenia clathrata*, *Platypteryx hamula*, *Coremia propugnata*, *Anaitis plagiata*, *Cabera exanthemaria*, *Thera obeliscata*, and *Eupithecia virgaureata* occurred. In the evening, as it was getting dusk, I was astonished to see three specimens of *Vanessa cardui* flying, and, after a deal of patience, I succeeded in capturing two. Does this species usually fly at dusk? Although I have seen many before, I never saw one on the wing at dusk. Among other species, *Cidaria russata*, *C. corylata*, *Grammesia trilinea* (a smoky var.). June 12th. *Acontia (Dysthymia) luctuosa*, *Strenia clathrata*, and *Lycæna minima* were taken. In the evening of June 13th I went to "Paradise" again. Besides the usual number of common species, I found two beautiful specimens of *Numeria pulveraria*, and one male *Arctia villica*. 14th. I did not do any very active collecting, but took a nice specimen of *Lobophora viretata* off a wall in Eastbourne. 16th. I went nothing in the evening, and obtained, among other things, *Cidaria immanata*, a single specimen of *Coremia unidentata*, and a female *Orgyia pudibunda*.

Thecla rubi and *Argynnis selene* occurred sparingly in Abbotts Wood on the 18th, and among other species that I captured was *Tephrosia exter-saria*. 25th. *Plusia gamma* swarmed at Eastbourne, and single specimens of *Hecatera serena*, *Caradrina cubicularis*, and *Dianthæcia conspersa* turned up. 26th. I visited Heathfield, and took in a fine pine-wood there, *I. lactearia*, *T. obeliscata*, *Bupalus piniaria* (very common), and single specimens of *Melanthia albicillata*, *Eupithecia coronata*, *Z. porata*, and *Ellopiæ fasciaria*. 27th. A specimen each of *Plusia chrysitis*, *Melanippe rivata*, and *M. galiata* at Eastbourne, besides the ordinary moths. 28th. I again visited Heathfield, the weather being more promising than on the 26th. *Euthemonia russula* was common on heath; I took twelve males to two females. *Bupalus piniaria* was also very common—two females to one male. (I have never before observed the sexes of this species in these proportions.) *T. obeliscata* (common), *L. pectinitaria* (one), *Ematurga atomaria* (males and females common), three *Macaria liturata*, two *Zygæna filipendulæ*, *Eubolia palumbaria* (very common), and single specimens of *Lithosia mesomella*, *Iodis vernaria*, and *Phytometra aenea*. 29th. Took two beautiful specimens of *Chærocampa porcellus* in some long grass at Beachy Head.—STANLEY A. BLENKARN; Clifton House, East Dulwich Road, S.E.

NOTES FROM DOVER.—Although I have done but little collecting this season, yet a few notes of the insects taken in this neighbourhood may be

of interest. During March and April I bred, amongst other things, *Dasychira pudibunda*, *Drepana unguicula*, and *Demas coryli*. On April 21st *Pararge egeria* was out; I only took one specimen this year, where in previous years I have taken them in plenty. The advance of bricks and mortar is the cause of this. On the same day two nice *Cidaria suffumata*, with *Anticlea badiata* and *Taniocampa rubricosa*. There are so few salallows about this district, and what there are are so far from the town, that I did nothing in this line. During May *Halias prasinana* and *Zonosoma punctaria* emerged, and a nice *Notodonta chaonia* was taken on the sea-front at the electric light. On the 24th *Euchloë cardamines*, *Nisoniades tages*, *Lycæna (Cyaniris) argiolus*, L. (*Polyommatus*) *bellargus*, *Nemeobius lucina*, and *Thecla (Callophrys) rubi* were out. This year *L. argiolus* seems to have been more plentiful than ever—it was everywhere. I noticed several specimens of the second brood, which I do not remember having done before. June brought (*inter alia*) *Zonosoma omicronaria*, *Bapta temerata*, *B. bimaculata* (*taminata*), *Minoa murinata* (*euphorbiata*), *Ligdia adustata*, *Euclidia mi*, *E. glyphica*. A couple of *Dianthæcia albinacula* were taken flying at *Silene nutans*. One turned out to be a female, and I obtained a few ova; they duly hatched, and were fed on bladder-campion, and all went, as I thought, well. On turning them out, however, I found but two pupæ and a fat larva, while another pupa was partly eaten. I think these larvæ must be cannibals. Larvæ of *Porthesia chrysorrhæa* were in large numbers, along with a few *Diloba caruleocephala*, on the whitethorn hedges. *Lycæna (Cupido) minima* was to be taken plentifully up by the convict prison, and one could obtain perfect specimens when the sun was down as they sat on the grass. One or two *Chærocampa porcellus* were also taken on the cliff by the prison. In July I made two excursions for *Aporia cratægi*; on the first occasion I saw none, and, in fact, there seemed scarcely any insect-life about in the *cratægi* locality. On my second visit things were almost as bad, for I only took one *cratægi*, and that such a poor ragged female that I let her go again. I believe a few specimens have been taken this year, but they are certainly getting scarcer year by year. It seems very strange that in 1896 this insect should have been so plentiful—it was in scores—and nobody be able to throw any light as to the cause of this profusion. If the insect has been planted in this neighbourhood, as some seem to think, why does not the man who did so come forward, and let us have particulars? Anyhow, the species is evidently dying out, and will soon need replenishing with a fresh stock. Will it be forthcoming? In August I took a few *Colias hyale* and *C. edusa*. They were to be taken on the downs, and in almost any clover-field round here, along with a few *Pyrameis cardui*. *Hyale* was the more plentiful, and varied considerably; but neither *edusa* nor *hyale* could be said to occur abundantly. I have not heard that the var. *helice* has been taken here. Some *Eremobia ochroleuca* on the heads of "ragged jack" (knapweed), and several *Aspilates citraria* and *A. gilvaria* on the downs completed my August captures. In October the ivy had its usual visitors, including *Orthosia macilenta*, *Anchocelis pistacina*, *Cerastis vaccinii*, *C. spadicea*, *Xanthia ferruginea*, &c. A nice male *Himera pennaria* on a gas-lamp on the 26th, and a *Caradrina quadripunctata* on the 3rd inst., with an *Agrotis suffusa* on the 8th, complete my season's captures. The list is rather a poor one, owing to my time for collecting having been very limited. I should judge from what I can gather from local collectors that the season has been one of the best.—H. DOUGLAS STOCKWELL; 2, Albert Road, Dover, Nov. 24th, 1900.

NOTES FROM NORTH KENT.—My cousin, Mr. T. Mitford Cottam, and myself had about five days' collecting in the neighbourhood of Darenth Wood, Farningham, and Eynsford between June 9th and 14th, 1900. The weather most of the time was fine and hot, but we were let in for one bad storm, accompanied by terrific rain. Butterflies were fairly plentiful; we observed seventeen species. *Pieris brassicae*, *P. rapae*, *P. napi*, *Euchloë cardamines*, *Ctenonympha pamphilus*, and *Lycæna icarus* were all common. We saw a few *Gonopteryx rhamni*, one *Argynnis euphrosyne*, one *Vanessa io*, a few *V. urticae*, and *Polyommatus phlaeas*; and captured a few *Thecla rubi*, *Lycæna argiolus*, *L. agestis*, and *Nisoniades tages*; two *Lycæna alsus*, and one *Syrichthus malvae*. The only Bombyces that we saw or captured were *Euchelia jacobæ* (one taken, others seen), *Arctia villica* (one from palings, another seen flying), *Spilosoma menthastri*, *Hepialus lupulinus* (common), *H. hectus* (few), *Bombyx neustria* (larvæ abundant), and *Drepana fulcula* (few). The following moths were taken over red valerian:—*Sphinx ligustri*, *Cherocampa porcellus*, *Leucania comma*, *Mamestra anceps* (common), *M. brassicae*, *Apamea basilinea*, *Caradrina morpheus*, *Agrotis segetum*, *A. exclamatoris*, *Noctua c-nigrum*, *Dianthæcia carpophaga*, *Hadena trifolii*, *Cucullia chamomillæ* (one), and *Plusia gamma* (abundant). We also found another *Cucullia chamomillæ*, and one *Miana strigilis* at rest; one more *Dianthæcia carpophaga* at campion, and a few *Euclidia mi* flying in the sunshine. Our only capture at sugar was one *Miana strigilis*. Thirty-two different species of Geometræ were captured. The following were obtained by beating:—*Rumia cratagata*, *Venilia macularia* (also seen very commonly flying in sunshine), *Iodis lactearia*, *Ephyra porata*, *E. punctaria*, *Asthena candidata* (common), *Eupisteria oblitterata*, *Acidalia trigeminata*, *A. ornata*, *A. marginepunctata*, *A. remutaria* (abundant), *Cabera pusaria* (common), *Bapta temerata*, *B. taminata*, *Numeria pulveraria* (one), *Panagra petraria*, *Lomaspilis marginata* (common), *Melanippe sociata* (common), *M. montanata* (abundant in Birch Wood), *M. galiata* (one), *Camptogramma bilineata* (common), *Phibalapteryx vitalbata*, *Cidaria corylata* (one). On tree-trunks we found *Tephrosia biundularia* (one), *T. extersaria*, *T. punctularia* (common), *Eupithecia exigua* (?); and two *Anaitis plagiata*, one at rest and one flying. Dusking produced the following additional species:—*Eupithecia oblongata*, *Hypsipetes impluviata*, *Ephyra pendularia*, and *Melanippe fluctuata*. The Deltoides were represented by *Herminia barbalis* and *H. grisealis*. PHILIP J. BARRAUD; Bushey Heath, Herts.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON. — November 21st, 1900.—Mr. G. H. Verrall, President, in the chair.—Mr. H. Wood, of the Old Grammar School, Ashford, Kent, and Herr Moser, of 90, Bulow Strasse, Berlin, were elected Fellows of the Society. — Mr. H. W. Andrews exhibited *Atherix crassipes*, Mg., a dipteran new to the British list, taken near Ticehurst, Sussex. Mr. Verrall remarked that the species was but little known on the Continent, and quite unexpected in England. Originally described in 1820, there was no record of its re-occurrence until 1864, and there have been only one or two slight references to it since. He added that it was a most distinct species, and, like *Leptis*, was addicted to settling upon the leaves of alder.—Col. Yerbury exhibited (a) *Anthrax paniscus*, bred from a lepidopterous pupa found in sand at St. Helen's, Isle of Wight, by Mr. Holland,

Hope Museum, Oxford. Pupa found 7th July, 1899, fly emerged 12th of the same month. Schiner records *Anthrax* as being parasitic in the larvæ and pupæ of Lepidoptera and Hymenoptera. Dr. Sharp states that M. Künckel d'Herculais bred *Anthrax fenestralis* (*fenestrata*?) from the egg-case of a large locust, *Ocnerodes* sp. He also exhibited (b) *Tabanus bromius*—pupa found as above, emerged 12th July, 1899, observing that *Tabanus* is generally supposed to breed in wet mud round the margin of pools; and (c) a new species of *Cordylura*, of which five males and five females were taken at Aviemore in July, 1899, and further specimens again in abundance in the same place June, 1900. Col. Yerbury mentioned also that he had sent some of them to Herr Th. Becker in Silesia, in the hope that the species would have received ere now a distinctive name.—Mr. L. B. Prout exhibited three male specimens of *Proutia betulina*, Z., and two of *P. eppingella*, Tutt, bred from larvæ taken this season in Epping Forest. He remarked that both species occurred in the same part of the forest, and the larvæ appeared to be attached chiefly to old hawthorns. Excepting in the smaller size of *P. eppingella*, no superficial difference was observable between the two species. The specimens of *P. betulina*, however, emerged about ten days earlier, the dates being July 5th, 8th, and 9th, while *P. eppingella* appeared between July 14th and 21st. Dr. Chapman said that, accepting provisionally Mr. Tutt's name of *eppingella* for the last species, as a way of avoiding the difficulty of determining whether it be the *salicolella* of Bruand or his *anicanella*, which seems more probable, or a distinct species, he might call attention to the fact that he knew of no other British males of the species, except one previously bred by Mr. Prout, and one of unknown locality in Dr. Mason's collection. It is at once distinguishable from *P. betulina* by the numerous joints to the antennæ (27 instead of 21–24, 24 instead of 18–21, if only the joints visible by their pectination outside the head clothing be counted), which are nevertheless shorter, and by the shortness of the anterior tibiæ (.21 mm. instead of .29 mm.), as well as by the less difficult characters of the colour, size, form of wing, &c.—Dr. Chapman said that Mr. Merrifield had called attention at a recent meeting of the Society to the difference in the wing markings in the pupa and in the imago of *Aporia crategi*, and exhibited some specimens of considerable interest in relation to the question of correspondence or otherwise of pupal and imaginal wings, viz. the imaginal wings of *Aporia crategi* removed from the pupa at a certain stage of their development. The specimens showed that at this particular stage the imaginal wings presented the markings of the pupal wing, a set of markings which are in a way the reverse of those of the mature imago. The specimens also showed that this stage was one when the imaginal wing was still so immature that it was almost impossible to handle it without producing injury and distortion. Though the markings were there, they were not produced by pigmentation, at least not by formed pigment. The dark markings of the pupal wings were represented by areas that were more transparent than the rest of the wing. The fact, he remarked, was curious enough whatever might be its minute anatomy and precise meaning. The pigmentation of dark areas, Dr. Chapman remarked, is usually the latest to develop, and here we have apparently a less development in the dark area than on the pale; and

this may be therefore a reminiscence of an ancestor that possessed these dark markings as an imago. He very much doubted this, however, partly because of the great variability of these dark pupal markings, and partly because there was no question of pigment involved. Exhibited specimens of the wings at a later stage, showed the true imaginal markings developed. The white pigment was well developed, while the dark markings were still very transparent, little pigment being yet developed on them. The solidity and firmness of these specimens showed how much later they are than the others. With regard to these effects, Dr. Chapman explained them to some extent as analogous to photographic effects. It was quite possible, he thought, that light and heat caused a differential effect through the different coloured areas of the pupa. Another specimen, Dr. Chapman thought, might throw some light on the question of supernumerary joints and limbs in insects. He had, he said, in this connection made several hundred experiments upon *Porthetria dispar* last summer, but of these had as yet only examined about a dozen, one of them being the specimen exhibited. The larval limb in this case, by some mistake, had not been cleanly amputated, but partially crushed. This was done at the last larval moult, and also probably so immediately after the moult that the parts had not yet fully expanded, still less hardened, resulting, as the specimen showed, in their remaining only partially expanded. The result in the imago was a limb in which all the parts were abnormal, even the trochanter, whilst the femur was curiously flattened out triangularly, bearing on one angle an unquestionable tibia and tarsus, and on the other a member that was no doubt an abortive tibia, since it bore at least one short spur.—A paper was also communicated on "Contributions to a Knowledge of the Rhynchota," by W. L. Distant, and "An Account of a Collection of Rhopalocera made at Zomba, British Central Africa," by Mr. P. I. Lathy.—C. J. GAHAN and H. ROWLAND BROWN, *Hon. Secs.*

SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—*October 25th, 1900.*—Mr. W. J. Lucas, B.A., F.E.S., President, in the chair. Mr. Kirkaldy, Worple Road, Wimbledon, was elected a member. Mr. MacArthur exhibited specimens of *Agrotis vitellina* from Shoreham, an example of *Amphipyra tragopogonis* with pale marginal blotches on the fore wings, and a specimen of *Hesperia (Thymelicus) thaumas* of a pale straw colour. Mr. Lucas, a specimen of the cockroach *Rhyparobia maderæ*, taken in a desk in Covent Garden Market. Mr. T. D. A. Cockerell, a photograph of a hollyhock plant as an example of the ravages of the larvæ of *Pyrameis cardui* at Raton in New Mexico. Mr. West, a series of a local homopteron, *Acocephalus brunneo-bifasciatus*, taken at Blackheath. Mr. R. Adkin, a series of the plain and banded forms of *Acidalia aversata*, bred in September from ova deposited by a banded female taken at Lewisham in July, and contributed notes on their history and variation; together with living larvæ of *Caradrina ambigua*. Mr. Mera, specimens of *Colias edusa* and var. *helice*, with intermediate varieties; very pale specimens of *C. hyale*; and a specimen of *Smerinthus populi* with the basal area of the hind wings suffused with yellow instead of dull red. Dr. Fremlin read a short paper on "Bacteria," illustrating his remarks with a varied exhibit showing the methods of culture.—H. J. TURNER, *Hon. Rep. Sec.*

RECENT LITERATURE.

F. V. THEOBALD. *Report of Insect Pests for 1899* (1900, Journ. South Eastern Agric. Coll., 21-48; five plates and two figs.).

The life-history of the asparagus beetle (*Crioceris asparagi*) has been worked out anew and compared with the American results detailed by Chittenden. Very few insects live on asparagus in this country, and only one—this beetle—does any amount of harm. Although very destructive in America and Continental Europe, its ravages here are very slight. Its natural enemies are the larvæ and imagoes of *Adalia bipunctata* (the 2-spot ladybird), which feed on the ova and larvæ of Chrysopidæ (lace-wing flies). The author considers hand-picking a sufficient remedy for small gardens, and spraying in August with arsenate of lead for larger areas.

An unknown species of thrips destroying scarlet runner beans is described and figured, and attention is called to the fact that practically nothing has been done with the British Thripidæ since Haliday's 'Synopsis,' which is now very incomplete.

Among the other notices in the Report are extended notes on the life-history of the hop aphid (*Phorodon humuli*), and the record of new pests, viz. the common cockchafer on hop, the moth *Gortyna flavago* on tomato, and the great grasshopper—*Leptophyes punctatissima*—on peach trees; the latter occurred in great numbers, many in copula, near Minster.

LEPIDOPTERA.

V. WEISZMANTEL (1900, 'Rovartani Lapok,' vii. pp. 175, and résumé 16) saw an individual of *Pieris brassicæ*, at Tusnád in the Siebenbürgen, whose under side had a bright rosy-red lustre, but failed to capture it.

H. G. DYAR (1900, Entom. News, xi. 517-26, pl. xiii.) gives an account, with coloured plate, of the life-history of the remarkable Central and South American slug-caterpillar, *Sibine fusca*.

CHRIST BURGER describes (1900, Illustr. Zeitschr. für Entom. v. 330, figure) a melanic aberration of *Pieris napi* as follows:—"Upper side: Ground colour unicolorous blackish grey; in obliquely-falling light, a faint violet iridescence, especially at the base and in the dorsal cells of the fore wings. The black speck at the apex always present in typical *napi*, and the occasional black spots in cells 1 and 3 of the fore wings are altogether absent. In the middle cells the ground colour is a trifle brighter. Nervures of the hind wings not widened. Fringes of the ground colour. Under side: Colouring as above. Specks and spots absent also from the fore wings. In the middle cells and in the inner part of cells 1 and 2 of the hind wings the colouring is somewhat brighter. The first four nervures of the hind wings appear considerably widened on account of the scattered, somewhat darker, scales on both sides. This is the only character by which this specimen can be recognized as belonging to *napi*, L. Fringes of the ground colour, antennæ unicolorous black, not annulate, apex of the club bright yellow ochre. Body covered with deep black hair, legs black, eyes brownish yellow. This extremely interesting, probably unique, specimen was found last spring at Dretzel, near Gläda, in Saxony."

L. AIGNER notices (*l.c.* 331) some gynandromorphs lately captured near Budapest:—(1) *Pieris daplidice*, L., var. *bellidice*, O. Right ♂, left ♀, abdomen ♀. (2) *Colias hyale*, L. Right ♂, left ♀, abdomen ♂. (3) *Lycæna bellargus*, Rott. Right ♂, left ♀.

G. W. K.

OBITUARY.

LE BARON MICHEL-EDMOND DE SELYS-LONGCHAMPS.—Almost simultaneously with the century has ended a career which lacked in length but twelve years of the century itself—that of the veteran Belgian entomologist, the Baron Michel-Edmond de Selys-Longchamps. Though born in Paris (May 25th, 1813), Liège had long been his home, and in connection with the district in which he lived the Baron held from time to time most important positions politically. His worth as a man of science was attested by his election on May 7th, 1841, as *correspondant* of the Académie Royale de Belgique. He became a member of the same in December, 1846, and was chosen Directeur de la Classe de Sciences in 1854 and in 1879. Amongst other recognitions of his work was his election as honorary fellow of the Entomological Society of London in 1871.

De Selys' name will always be associated with his labours in connection with the Odonata (dragonflies) as an authority on which order he has long been in the foremost rank. At the beginning of the century these insects were almost utterly neglected, and what little knowledge of them existed was in great confusion. The work of De Selys, however, ably assisted as it has been by that of Mr. R. McLachlan, Dr. H. A. Hagen, and a few others, has now placed this branch of entomology in such a position that those who take it up have a solid foundation on which to build.

There remain to attest De Selys' great activity over two hundred and fifty works and articles of greater or less length and importance, most of them having been published by the Belgian Academy and other learned societies. They cover a wide range of subjects; but the bulk of them treat of the Odonata. In 1840 appeared the 'Monographie des Libellulidées d'Europe,' this being the same year in which T. de Charpentier's 'Libellulinæ Europææ' saw the light. The latter, an *édition de luxe* with forty-eight well-coloured plates, savours of the old school, however, while the work of De Selys is of the new. The 'Monographie' was followed ten years later by a supplement, which holds at least equal importance with the original work—the 'Revue des Odonates ou Libellules d'Europe'; in this De Selys had Dr. Hagen as collaborator. The long list of his writings contains detailed synopses and monographs of several of the subfamilies of the dragonflies of the world, as well as lists and monographs of these insects for numerous restricted areas—all being contributions of the first importance to our knowledge of the Odonata.

With the death of the venerable Baron on Tuesday, December 11th, 1900, at the ripe age of 87, the world of entomology is the poorer by the loss of a prolific and careful writer, and a most genial correspondent.—W. J. L.



your very true
J H Leach

JOHN HENRY LEECH.

Born December 5th, 1862 ;

Died December 29th, 1900.

AGED THIRTY-EIGHT YEARS.



**An Earnest Student of Nature ; a Staunch and
Generous Friend.**

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[No. 453.]

THE LATE JOHN HENRY LEECH.

MR. J. H. LEECH, whose death we briefly announced in our last number, was the eldest son of the late Mr. John Leech, of Gorse Hall, Dukinfield, Cheshire, and of Mrs. Leech, of 4, Kensington Palace Gardens. He was educated at Eton and at Trinity Hall, Cambridge, where he took his B.A. degree. Quite early in his boyhood he evinced a strong passion for all kinds of natural history objects, and later he commenced to systematically collect and to study both Coleoptera and Lepidoptera. Although he had lost his left hand, the result of a gun accident in his college days, he was able to net and to box or bottle insects in the field almost or quite as deftly as before the misfortune occurred.

His first attempt to give practical effect to his views respecting the purpose and utility of a collection was in 1886, when he was chiefly interested in British Lepidoptera. He then published 'British Pyralides,' a book in which all the Deltoids, Pyralides, Crambi, and Pterophori, known at that date to occur in these islands, were each represented by a coloured figure. No doubt he would have produced similar works on the other neglected groups of moths if he had not about that time devised a very much more ambitious scheme in the interests of science. This was no less than the exploration of Japan, Corea, and certain untried or little known parts of the North-western Himalayas, and of Central and Western China. This plan was no sooner matured than it was put into execution, and from 1886 to 1893 there was a steady accumulation of entomological material in his museum from the countries mentioned. After 1887 he did not, himself, again collect abroad, but commenced to work out and to publish papers on the Lepidoptera he had met with in his travels, or had received from his collectors; and he continued to find pleasure in these labours up to almost the last month or so of

his regrettably short life. His *magnum opus* was 'Butterflies from China, Japan, and Corea,' a sumptuous work in three volumes, which will probably remain the standard authority on the subject for many years to come.

At one time Mr. Leech possessed a very large collection of Coleoptera. In 1889 or 1890, however, he decided to devote the whole of his attention to the formation of a collection of Palæarctic and Eastern Asian Lepidoptera, and he then discarded the beetles, and these passed into the museum at Tring. In amassing the lepidopterous material from which his collection has been built up he never for one moment allowed the matter of cost to deter him from the attainment of his desires. Independent of minor acquisitions of British Lepidoptera, he purchased several continental collections, among which were those of G. d'Emmick (Buda Pesth), Dolman (Denmark), M. Sand (Central France), and Mützell (Berlin). The latter, for which somewhere about one thousand pounds were paid, was well known for its fine series, especially of Butterflies, Sphinges, and Bombyces, and the very large number of aberrations comprised therein. Selections of Amurland species were also obtained from Dieckman, and of Central Asian Lepidoptera from Tancreé and Grum-Grshimailo.

The following chronological account of the various entomological expeditions personally undertaken by Mr. Leech, or organised and equipped by him, will convey some idea of the very thorough and comprehensive manner in which he carried out any work that he took in hand:—

In 1885 he, assisted by Mr. Meek, collected, with grand results, in Morocco, Canary Isles, and Madeira. In 1886 he commissioned Mr. Pratt to collect in North Syria, whilst he himself started on a journey to Corea and Japan. Arriving at Foochau, in Eastern China, about the beginning of April, he secured the loan of a houseboat from a friend, and proceeded to explore the Yuen-fu and Min rivers, and to investigate the insect fauna of the adjacent country. From Foochau he went north to the Snowy Valley, near Ningpo, a locality which had previously been found rich in insect-life by the late W. B. Pryer. Here he obtained accommodation in a Buddhist monastery, and stayed for a week or so, instructing during the time a native, whom he left to collect during the season; he then continued his journey to Japan. Nagasaki, in the southern island of Kiushiu, was the first Japanese locality visited, and there Lepidoptera were found abundantly wherever there was suitable—i.e. uncultivated—ground. A small native-built vessel was obtained, in which he visited the islands and parts of the western and southern coasts of Kiushiu, collecting with the greatest diligence wherever there seemed to be any prospect of success. Early in June he reached Fusan, Corea (but not in the native boat), where he was considerably hampered in his movements on account of cholera,

which he fortunately escaped, but which, by reason of the quarantining and fumigating that he was subjected to, caused him endless trouble then and for two months afterwards in Japan. After a short stay at Gensan, where his assistant, Mr. Smith, was left to collect, he returned at the end of June to Nagasaki, and thence commenced to travel, chiefly by land, to Yesso, the northern island of Japan, arriving at Hakodate on Aug. 5th. From the latter place he visited Nemoro and the Kurile Islands, but the results, from an entomological point of view, were not satisfactory, and he returned to Hakodate, finally making his way to Yokohama, *via* Sendai on the east coast of Central Japan, and reached that city at the end of September. Here he met the late Mr. Henry Pryer, whose extensive collection of Lepidoptera (less a portion of the "Micros") and Neuroptera he purchased *en bloc*. Before returning to England native collectors were engaged to work in Corea and the island of Kiusiu during the following year.

In 1887 Mr. Lionel de Nicéville accompanied Mr. Leech in his travels through the North-west Himalayas, when a large collection of Lepidoptera was made, and some very interesting species obtained, among them being several new to science, which have since been described by Sir George F. Hampson in his 'Moths of British India.' Some of the experiences connected with this trip appear to have been of a somewhat hazardous character, as, for example, when working among the glaciers of Baltistan, at an altitude of 18,000 ft. or thereabouts, *Parnassius charltonius* was met with. The nature of the locality did not afford anything in the way of a comfortable, not to say safe, camping pitch. Mr. Leech, however, being aware that this species, and also *Colias eogene* and some other desiderata, were to be had in this inhospitable situation, was determined not to move far from the spot without obtaining a good series of each species. The coolies were therefore set to work to level out a space so that the tents might be fixed up; this was accomplished, and two or three days were spent on the mountain side, and the coveted quarry secured, the series of *C. eogene* including some most remarkable aberrations. In 1887 also Mr. Pratt was engaged by Mr. Leech to proceed to China, with special instructions to investigate the insect fauna of the Yang-tze Valley. This he did for two seasons, and when Herr Kricheldorf, a German collector, was sent out to assist him in 1889, they, together with a number of natives, journeyed into Western China, and explored the country almost up to the Thibetan frontier; a second journey was made in 1890. In 1888 Mr. W. H. McArthur was commissioned to collect in parts of the North-West Himalayas, and was away two years, returning with a very fine collection. In 1891 Capt. B. Thompson went out to the ground previously worked by Mr. McArthur;

collecting was carried on by natives in China, Japan, and Syria, and consignments were received from Capt. Young, of Sullampore, Kulu.

Mr. Leech also went to South America in 1884, and collected on the Amazons, but the material, largely Micro-Lepidoptera, and mostly obtained at Para, was not kept by him. On one journey inland the whole party was attacked by yellow fever, and several of his followers died.

Not only was it due to Mr. Leech's great activity and lavish expenditure that many collections have been enriched by the additions thereto of species of which only one or two examples were previously known, but our knowledge of the insect fauna of Eastern Asia has been considerably increased by the results of his commendable enterprise. Over one thousand species of Lepidoptera have been described by him, and a very large number of other insects, as well as Lepidoptera, have been made known to science by various specialists to whom the material obtained either by himself or his collectors was submitted.

At the close of 1889 he purchased the 'Entomologist.' One of his objects in acquiring proprietorship of this Journal was that he might have a ready means of publishing papers on the insects he was then receiving from his collectors in China. Although those papers in no way trespassed upon the space usually available for matters connected with British Entomology, a certain section of the readers considered themselves justified in raising objections to their publication in the Journal. The consequence of this antagonistic feeling, which was largely fostered by the ungenerous comments of a contemporary, was that Mr. Leech, in 1892, almost entirely withdrew from the 'Entomologist,' and transferred his right in it to the then, and present, editor.

Mr. Leech was elected a Fellow of the Linnean Society in 1884, of the Zoological and Geographical Societies in 1885, and of the Entomological Society of London in 1887. He was also a member of the following continental Societies:—Société Entomologique de France (1888), Entomologischen Verein zu Berlin (1889), and Gesellschaft Iris zu Dresden (1890).

For about two years Mr. Leech had been troubled with asthma and bronchitis, and rather over a year ago he was advised that one lung was slightly affected; but he was not thought to be seriously ill until a very few hours before the end. The malady assumed an acute form on the evening of Dec. 28th, and he passed away peacefully in the early hours of the following morning.

His death creates a void in the entomological world which may not be readily filled, and he will be greatly missed by all who had the pleasure of knowing him personally. The writer of this memoir, who for over thirteen years had the privilege of

being associated with him in his entomological work, will ever hold him in tender remembrance.

The following are Mr. Leech's contributions to entomological literature :—

- 1879.—Coloured Paper for Cabinet Drawers (Entom. xii. p. 256).
 1880.—Variety of *Polyommatus phleas* [var. *schmidtii*] (Entom. xiii. p. 278).
Charocampa celerio in the Isle of Wight (Entom. xiii. p. 280).
 1881.—How Insects cross the Channel (Entom. xiv. p. 19).
 Abundance of *Lithosia rubricollis* (Entom. xiv. p. 158).
 1882.—A Day's Collecting on Ben Tigh (Entom. xv. pp. 269–271).
 1884.—A Fortnight's Collecting in Sicily (Entom. xvii. pp. 133–136).
 1886.—British Pyralides, including the Pterophoridae, pp. i–viii and 1–122, pls. i.–xviii.
 1887.—On the Lepidoptera of Japan and Corea: Pt. I. Rhopalocera (Proc. Zool. Soc. Lond. 1887, pp. 398–431, pls. xxxv. xxxvi.)
 1888.—On the Lepidoptera of Japan and Corea: Pt. II. Sphinges and Bombyces (Proc. Zool. Soc. Lond. 1888, pp. 580–655, pls. xxx.–i.)
 On a Collection of Lepidoptera from Kiukiang (Trans. Ent. Soc. Lond. 1889, pp. 99–148, pls. vii.–ix.)
 1890.—New Species of Lepidoptera from China (Entom. xxiii. pp. 26–50, 81–83, 109–114, 187–192).
 Two Days' Collecting in Normandy (Entom. xiii. pp. 223–227).
 Five Days' Collecting in Normandy (Entom. xxiii. pp. 228–290).
 Collecting on the Northumberland Coast (Entom. xiii. p. 292).
 1891.—New Species of Lepidoptera from China (Entom. Suppl. pp. 1–6).
 New Species of Rhopalocera from North-west China (Entom. Suppl. pp. 23–31).
 Descriptions of New Species of Geometridae from China, Japan, and Corea (Entom. Suppl. pp. 42–56).
 New Species of Rhopalocera from Western China (Entom. Suppl. pp. 57–61, 66–68).
Sirex gigas in Ireland (Entom. xxiv. p. 248).
 1892.—Lepidoptera in the Black Forest, Germany (Entom. xxv. p. 218).
 1893.—A New Species of *Papilio* and a new form of *Parnassius delphius* from Western China (Entom. Suppl. p. 104).
 1894.—*Sesia myopiiformis* at Kensington (Entom. xxvii. p. 245).
 1892–1894.—Butterflies from China, Japan, and Corea, pp. i–lv and 1–181, pls. i–xlii., and map and other illustrations.
 1896.—Uniformity in Setting (Entom. xxix. pp. 269–272).
 1897.—On Lepidoptera Heterocera from China, Japan, and Corea (Ann. and Mag. Nat. Hist. (6), xix. pp. 180–235, 297–349, 414–463, pls. vi. and vii.) [Epicopiidae, Uraniidae, Epiplemidae, Geometridae.]
 On Lepidoptera Heterocera from China, Japan, and Corea: Pt. II. (Ann. and Mag. Nat. Hist. (6), xix. pp. 543–573, 640–679; xx. pp. 65–110, 228–248, pls. vii. and viii.) [Geometridae.]

- 1898.—Lepidoptera Heterocera from Northern China, Japan, and
 Korea: Pt. I. (Trans. Ent. Soc. Lond. 1898, pp. 261-379).
 [Sphinges and Bombyces.]
 New Species of *Syntomis* from China (Entom. xxxi. pp. 152-154).
- 1899.—Lepidoptera Heterocera from Northern China, Japan, and
 Korea: Pt. II. (Trans. Ent. Soc. Lond. 1899, pp. 99-219).
 [Bombyces.]
- 1900.—Lepidoptera Heterocera from Northern China, Japan, and
 Korea: Pt. III. (Trans. Ent. Soc. Lond. 1900, pp. 9-161).
 [Cymatophoridae and Noctuidae.]
 Lepidoptera Heterocera from Northern China, Japan, and
 Korea: Pt. IV. (Trans. Ent. Soc. Lond. 1900, pp. 511-663). [Noctuidae.]

FURTHER NOTES ON SINHALESE RHYNCHOTA.

By G. W. KIRKALDY, F.E.S.

Fam. TETIGONIIDÆ.

Tribe GYPONINI [= subf. GYPONINA, Stål.].

This tribe has been in a chronic state of fluctuation as regards its components; at present, however, it may be regarded as distinguished by the generally flat and horizontal vertex, two basal ocelli, antennæ remote from the eyes, juga usually considerably expanded, posterior lobe of intermediate coxæ without an acute spine.

EOGYPONA, gen. nov.*

Closely allied to the American *Gypona*, Germ. Head clypeate, not foliaceous, subhorizontal, slightly inclined upwards apically, subhemispherical, subangular apically, lightly carinate medianly longitudinally; frons: basal half tumid, widely but superficially sulcate medianly longitudinally, the apical half consists simply of a narrow carina. The antennæ are situated about midway between the lateral margins of the head and the frons; the first segment of the peduncle is not so wide compared with the second, as in *Gypona*. Rostrum very short, reaching to midway between anterior and interior coxæ. The genæ are greatly expanded dorsally and ventrally. Head, thorax, and elytra somewhat closely punctured. Anterior margin of pronotum slightly convex, posterior margin slightly roundly excavate; antero-lateral margin slightly longer than postero-lateral, these two forming an obtuse angle with one another. Scutellum large, subequilateral; base of metanotum rounded. Elytra: claval

* "*EOgypona*" perhaps more correctly, but the form given exceeds in euphony.

suture strongly marked, neurulation of corium very much as in *Gypona glauca* (Fabr.), but there is no membrane. The second apical area of the wings is quadrangular. Posterior femora apically bispinose, tibiæ externally with five strong short spines, tarsi short and stout. There is a somewhat elevated *transverse* carina extending across the sterna, separating the anterior and posterior lobes of the intermediate coxæ. Connexivum ventral, subvertical, strongly developed. Type, *E. kirbyi*, Kirkaldy,

This genus is distinguished from its American ally by the form of the head and of the antennæ.

1. *E. KIRBYI* (Kirkaldy).

†*Gypona* (?) *kirbyi*, Kirk., 1900, Entom. p. 294.

†*Gypona striata*, Kirby, 1891, nec Burmeister, 1835.

In the female the 6th abdominal segment is convexly rounded apically, and not excavated as in most species of *Gypona*. The head is shorter and squarer than in *E. walkeri*, being 5-angulate, while in *walkeri* it is triangulate.

E. WALKERI (Kirkaldy).

†*Gypona* (?) *walkeri*, Kirk., 1900, Entom. p. 294.

†*Gypona prasina*, Walk., nec Burm.

In the female the 6th abdominal segment is straight apically, the 7th being enormously long in proportion to the others.

Fam. FULGORIDÆ.

EODELPHAX, gen. nov.*

Belongs to subf. Asiracinæ (Delphacinæ of authors). Vertex nearly square, depressed inwardly, the lateral margins forming a sharp carina extending alongside the inner margin of the eyes as far as the intero-posterior angle of the latter, which extends posteriorly almost as far as to the base of the pronotum. These carinæ are continued forward to the apex of the head, forming a right angle there; the part of the vertex anterior to these carinæ is depressed inwards, declivous, and rounded marginally. Vertex feebly carinate medianly longitudinally. Frons long-oval, truncate at each end, carinate (with clypeus) medianly; clypeus long, triangular. Antennæ prominent, very large, first segment compressed and dilated, obliquely triangular, the interior side longer than the exterior; second segment slightly longer than the first, compressed, very tuberculate. Eyes latero-ventrally deeply grooved medianly to admit the cariniform first segment of the antennæ during repose. Rostrum reaching to posterior coxæ. Pronotum slightly narrower apically than the base of the head,

* "*Eos*" in this combination and in "*Eogypona*" has reference to "dawn" as applied to the Oriental Region, not as supposing an ancestral form, as in *Eohippus*, &c.

expanded broadly about as far as the exterior margins of the eyes, feebly tricarinate; scutellum longer than head and pronotum together, feebly 5-carinate. Tegmina extending far beyond apex of abdomen, the majority of the nervures somewhat closely granulate. Legs simple, posterior tibiæ trispinose. Type, *E. serendiba*, Kirkaldy.

Somewhat closely related to *Pundaluoya*, Kirkaldy.

E. SERENDIBA, sp. n.

Subfuscous, hyaline, tegmina obscurely marked with dark brown, three small spots on the interior margin of the clavus, and some irregular ones on the membrane. The legs—especially femora—antennæ, &c., chequered with blackish brown. Venter dirty stramineous. Length, $7\frac{1}{2}$ mill.

♀. Only the first (apparent) ventral segment is entire, the ovipositor extending backwards as far as the apex of the (apparent) third.

Pundaluoya, October, 1898 (E. E. Green).

FORCING *AGROTIS ASHWORTHII*.

BY ROBERT TAIT, JUN.

AFTER failing for two years in succession, I have again been successful in forcing *Agrotis ashworthii*, and have been able to get the perfect insect to emerge in exactly nine weeks from the hatching of the ova.

I paid a visit to the Penmaenmawr locality on July 21st, and found the perfect insect over, notwithstanding the late season. By careful searching, however, I secured a couple of batches of ova, and also found the remains of several batches which had already hatched. I again visited the spot a few days later, and found a few more ova, bringing my take up to about a hundred and thirty. They began to hatch on July 23rd, and as I was not returning home for another week, they were kept in a small flower-pot, covered with fine loam, and supplied with sawdust, which was kept fresh by being in water.

I returned home on July 30th, and at once divided the larvæ into four batches, putting them into medium-sized flower-pots, and placing them on the kitchen mantelpiece. I then had one hundred and twenty-five larvæ, and they fed well on sawdust until the end of August. Some of them fed up much more rapidly than others, and when they were nearly full grown I removed them to a roomy cage, with earth for them to pupate in, and kept them on the wooden covering of a hot-water cylinder. As they grew, I gradually moved them from the flower-pots to this cage, and they soon began to disappear in the soil provided for them.

About the middle of September the sallow began to fail, and those larvæ which were then left were given lettuce. This, however, did not agree with them very well, and, after about seventy had pupated, the remainder either died off or absolutely refused to feed.

On September 30th, or exactly nine weeks from the ova, the first imago emerged, and they continued to do so until November 9th, when the last specimen appeared, making sixty-two in all. I examined the remaining pupæ and found them dead, probably having been damaged when removing them from the earth in order to take them with me when I had to leave home for a week in October.

The largest number which emerged on one day was seven, on October 9th, and, though I have one or two small ones, there is not a single cripple. I found that they emerged at all times, from early morning to late in the evening, and rarely moved after their wings had dried. As soon as this had taken place they settled in some corner or crevice in the cage, just as they do in a state of nature. They never flew at night, and, although I left several which came out late, they were perfectly fresh the next morning.

I am inclined to think that the insect is sluggish by nature, and this will probably account for its being so seldom taken at sugar. I have sugared regularly in its haunts, when I have taken it at rest during the day, but have only caught three specimens by this method.

The bred specimens vary considerably, and range from the palest dove colour to a dark slate colour, with intermediate forms, having a dark band on a light ground.

I think my success in rearing the species was due to the fact that the larvæ were put into warm quarters soon after hatching. On previous occasions they were kept for about a fortnight before the forcing commenced, owing to my absence from home.

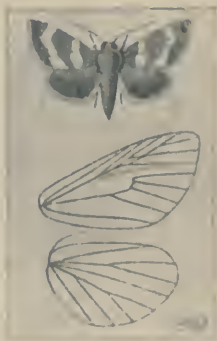
One thing about *A. ashworthii* which puzzles me is that batches of ova are laid in small tufts of grass among the rocks, yards away from growing plants of any kind, so that either many of the larvæ must perish from hunger, or else they must be great travellers. The former appears very probable, as in my experience the number of imagos to be found in any season is not proportionate to the number of ova laid. The female deposits the ova in batches of from twenty to fifty, and, if only half of the larvæ lived, the insect should be quite plentiful in most seasons.

15, Rectory Road, Crumpsall, Manchester : Dec. 15th, 1900.

THE OLDEST EXISTING MOTH.

BY F. W. FROHAWK, F.E.S., M.B.O.U.

I RECENTLY received for examination a moth which is undoubtedly the oldest existing specimen, probably about one hundred years older than any now in existence. It was found last October, compressed between a document written in Mexico in the year 1650, dealing with the sale of land. This, with others written at the same period, and relating to similar transactions, were all wrapped in a leather covering and stored away, as I understand, in a government locker, with other ancient deeds. These documents had remained untouched since the time they were written and stored away, two hundred and fifty years ago, until last October, when the specimen now figured was found



completely flattened between its folds. The moth is so much flattened that it is obvious that the document was folded up with the specimen inside, so there remains no doubt whatever that it did not enter afterwards, as that would have been an impossibility.

The finder, not being accustomed to handle such delicate objects, unfortunately damaged both wings on the right side, and broke off the antennæ, otherwise it would have been quite perfect. The colouring is in a wonderful state of preservation, being beautifully fresh. Not finding the specimen represented in the British Museum or in other large collections, I sent a sketch of the moth to Mr. Herbert Druce, who kindly identified the species for me as *Rhododipsa miniana*, Grote, belonging to the family Acontidæ; the type described from Northern New Mexico is in the collection of Prof. Snow, at Lawrence, Kansas. It was described by Grote in "Papilio," vol. i. p. 175 (1881), and figured by him in vol. ii. pl. i. (1882). My friend Dr. Butler writes me: "The figures in 'Papilio' are rather rough, and the neuration is not given, so that a really good figure with neuration would be useful."

The specimen is a female. The primaries have the ground colour ochreous buff, each crossed by two whitish bands; the first near the base is slightly curved and bulging in the centre, the second beyond the middle is zigzag; there is an apical crescentic spot of brilliant rose-red, a very small dot of the same colour at the hinder angle, also traces of others indicating a submarginal series; secondaries are bright rose-red blending into pale ochreous along the costal area, fringes yellowish, head, thorax, abdomen, and legs all pale ochreous, antennæ missing; as shown in the figure of the neuration, the discoidal cell of the secondary is open, and partly so in the primary.

January, 1901.

OPORABIA AUTUMNATA AT HOME.

By J. E. R. ALLEN, M.A.

THE various forms occurring in the genus *Oporabia* have been very fully described, in all their stages, by Mr. Prout, but not much has been said concerning the habits of the insects in their wild state. My experiences in hunting *O. autumnata*, during the years 1898–1900 may therefore be of some interest.

During my first three seasons at Enniskillen, I did not find *O. autumnata*, though specimens had been taken by both Colonel Partridge and Captain Brown. My failure was, no doubt, due to the somewhat restricted habitat of the species. In 1898, putting together hints received from Captain Brown and Mr. Prout, I tried a plantation of tall alder trees in a private demesne near Enniskillen. I soon found some *Oporabia* larvæ, which seemed to be different from those which I had previously been taking. The first difference noticed was that the alder larvæ were more backward in growth; afterwards I noticed that not one of them showed any trace of purple markings, while the larvæ beaten from oak and whitethorn (chiefly the latter), in an adjacent open park, separated only by a thorn hedge from the alder plantation, included a fair proportion of purple-marked individuals. The alder larvæ in the early stages had indistinct yellow stripes in addition to the spiracular line, but in the last stage they were of a uniform green but for the spiracular line, and practically indistinguishable from the whitethorn larvæ, except when the latter showed the purple stripe.

The two lots of larvæ, from whitethorn and alder, were carefully kept separate, and maintained their difference of growth throughout. A number of the former and a few of the latter were full-fed about May 14th; some of the former were feeding up to May 31st, some of the latter up to June 10th; the former emerged September 24th to October 7th, the latter September 24th to November 6th. I should add that I had sent away a few of the earliest of the whitethorn larvæ, otherwise

the dates for these would have been a little earlier. The two series of moths were easily distinguishable, both by colour and by the direction of the median line on the fore wings. The alder-bred moths were silvery-grey, varying in depth, but never approaching brown, with the median line bent at a right angle about a fourth of the distance from the costa. Those bred from whitethorn were brown, with the median line irregularly waved and dentated.

From September 30th to October 5th I took a few moths in the alder plantation, all resembling those bred from alder. I disturbed them by jarring the trunks of the trees, but they often flew from one tree to another, without descending low enough for the net. None were seen at rest on the trees, and no females were taken. An attempt to hunt the moths by lantern light proved a failure.

I submitted all these specimens to the inspection of Mr. Prout, and his reply satisfied me that I had two distinct forms, the alder-bred specimens being *autumnata*, and the whitethorn-bred *dilutata*. In 1899 I did not keep any larvæ, except a few found on birch (which I failed to rear), and a part of a small brood of *autumnata* from an accidental pairing in captivity. These began to hatch March 22nd, and took to whitethorn so readily that I never offered them any other food. I reared ten specimens, all closely resembling the parents.

In 1900, I found the larvæ fairly common in another alder plantation, near the former one, consisting of lower trees, and therefore easier to work. The moths bred in this year show a much wider range of variation, some being very dark, like the specimens figured by Mr. Prout in Entom. xxxiii. Pl. I., figs. 12 to 15, while one resembled fig. 5 on the same plate (var. *sandbergi*). The most interesting circumstance was that I bred an unmistakable *dilutata* from the alder-fed larvæ; also a yellowish specimen, which Mr. Prout refers to his var. *christyi* of *dilutata*. The larvæ from the two plantations were not kept separate, and I suspect that these larvæ came from the new plantation, as I also captured a few *dilutata* in this plantation. In the original plantation I had this year a curious instance of the way in which the two forms keep within their respective bounds. From a small hazel tree growing in the midst of the alders I beat a few larvæ, one with conspicuous purple marks. I kept these separate, and the moths turned out to be typical *dilutata*. I also reared this year two *autumnata* from larvæ taken on birch, but in the midst of the alder plantation. Of these two, one was the lightest and the other almost the darkest I have ever bred. I have never known *autumnata* to stray away from the alder plantations. All the moths taken at street-lamps in the town, and in other parts of the district, are most obviously *dilutata*. A few specimens which were taken at a short distance from the *autumnata* localities, and which I once thought might be

autumnata, are referred by Mr. Prout to *dilutata* var. *christyi*. In addition to bred specimens, I captured a fair number of *autumnata* this year. Of the captured specimens only one was a female, and only one was seen at rest on an alder trunk. All the others were disturbed from the alders, as in 1898, though this year they seemed not to fly so high.

A few notes on *O. filigrammaria* by way of contrast. It occurs on the open moors in Lancashire, and may be found at the end of August and in the first half of September, at rest on stone walls, where it is easily captured without net. I believe it may also be taken at dusk. It is smaller than *autumnata*, and runs into glossy dark brown forms, such as do not seem to occur in *autumnata*, though the lighter forms of *filigrammaria* resemble *autumnata* very closely. The larvæ of *O. filigrammaria* hatch early in February. They have in all stages distinct yellow stripes in addition to the spiracular line, differing in this respect from *O. autumnata*, though, like it, they never show any trace of purple marking.

CARADRINA AMBIGUA IN HAMPSHIRE.

By J. Hy. FOWLER.

DURING the last week in September I put about a dozen females of *Caradrina ambigua* in a box amongst primrose leaves, and succeeded in obtaining some hundreds of ova, which were deposited indiscriminately upon the leaves and on the sides of the box; the ova were very small, pale yellowish white. The larvæ hatched out in about sixteen days' time, and were long and thread-like, at first dark brown grey in colour, and hairy. As they grew to full size they became much less hairy; they had two hairs upon each segment, forming a row lengthwise upon each side of the dorsal stripe, each hair placed upon a slight pale tubercle; the spiracles black and hairy; numerous very short grey hairs scattered about the body also.

When full grown the larva is just an inch long, stout, and only slightly tapering towards the head; it is several shades of brown and grey, underneath a little paler than the sides, lateral stripe semi-double and yellow, bordered broadly dark brown with fine black lines, which radiate into the dorsal stripe; dorsal stripe light brown, narrowing towards the head, latter small and shining brown, divided by a yellow V, which contains a black dot in the middle. The first three segments are more or less dark all over; on the upper surface is an interrupted white line bordered with dark brown, followed by eight arrow-head markings, the barbs being hair-like, with the terminals having distinct dots; the anal spot is long and centred with paler. I

supplied the larvæ with plantain and groundsel; they eat each plant readily. They commenced to pupate on November 20th, amongst the rootlets of the groundsel, upon the surface of the earth, and between plantain leaves; one spun a neat cocoon of dark grey silk upon the muslin cover. When spun upon the soil the cocoon is soft and loose, but tough. The larva does not change for over a fortnight after spinning; the pupa is nearly white at first, gradually changing to a lively light red. I have over a hundred pupæ, so far, and many larvæ of all sizes still feeding.

As previously mentioned (Entom. xxxiii. 272), I took this species upon the wing in abundance during September; it occurred upon clematis flowers right up to October 21st. Some nights scarcely any were seen, others it was plentiful; three of us obtained over eighty one evening; worn ones were numerous and unmolested.

It is usually stated that this second brood is smaller than the first, but this does not seem to be correct, as most of mine quite equalled them in size. The only difference I find is that they are much darker; the shades of grey in fresh specimens vary considerably; a few are uniformly dark, with stigmata and lines indistinct; some are mottled grey, stigmata clear, lines distinct and strongly dentated; others are quite brownish, in fact a few would pass for *C. blanda* were it not for their white hind wings; one or two very pale and yellowish, quite fresh, but all specimens as they get old are extremely pale, and with ragged fringes. The best I took is very light all over, with thorax and body nearly white. The hind wings vary also; a few females are brown all over, others have the nervules dark, also the borders of the wings, the latter narrowly edged with a clear yellow line before the dark fringes; in most specimens the centre of the wings contain a remnant of a line, generally three or four dots, which are more conspicuous in this species than any other of this group that I am acquainted with.

The stigmata vary very much; in some specimens that I have they are of nearly equal size, some very large and clear, one scarcely showing any at all; but most are filled in with a slightly darker shade than the ground, the only exceptions being the pale varieties, and the dark reddish specimens.

Upon the clematis flowers there were many large grey spiders roaming about in search of prey, and it does not seem possible that they could manage to catch and hold such large game as a *Caradrina*, but many an *ambigua*, and even one *P. meticulosa*, fell victims to them. I saw in many instances a moth being firmly held by the head, the part the spider always attacks; it kills the moth, and eats out the interior, leaving only the wings and abdomen. The *meticulosa* was very lively, but did not escape.

Ringwood, Hants: January, 1901.

MARGINAL WING BRISTLES IN LEPIDOPTERA.

BY AMBROSE QUAIL, F.E.S.

IN the present article I do not make an exhaustive enquiry into the subject, and although not previously observed by me in my examination of the wings while studying the neuration—maybe the bristles have been destroyed when the wing scales were being removed—it seems impossible that they have been overlooked by others. Incidentally, I have read a good deal that has been written in reference to wing structure in the Lepidoptera, but I cannot recollect a record hitherto, and such works as are available make no reference to the presence of erect marginal bristles at regular intervals on the wings of certain Lepidoptera.



I first noticed them while preparing drawings of wing scales for illustration by lantern in a recent local lecture.

Having examined different species amongst the Geometræ and observed the bristles to be present, I selected a British specimen of *Melanippe fluctuata* to demonstrate the existence of the bristles. This species has considerable affinity to the antipodean *Asaphodes megaspilata*, on which I first observed them.

The bristles once observed are very noticeable, and remind one of the smooth setæ of some larvæ. So far as my observations go they rise from the upper surface in the Geometræ; they are erect, not perpendicular, but nearly so; smooth and apparently circular in section, and taper from a substantial base to a fine curved point—the curve directed inward away from the fringes. At the base of the bristles is a round elevated “button,” several

diameters larger than the cavities into which the stems of the wing scales are inserted. On the fore wings the bristles may be observed near the base of the costal edge, and at regular intervals along the costa, round the apex and the outer edge, to near the extremity of the first cubital nervule; there are none beyond this point, nor on the inner margins of the fore wings. On the hind wings, the first bristle may be observed at the extremity of the first radial nervule, and they occur at regular intervals to very near the anal nervure.

The wing scales are of entirely different structures, and are horizontal to the surface of the wing; the fringe scales continue the horizontal plane beyond the margin of the membrane. All round the margin of each wing, the scales are inserted into cavities, very close together, and there are at least three rows of such parallel to each other. The bristles are so far removed from the extreme margin of the wing that they are inner to the second row of scales, and between each of the bristles, according to the distance apart, there are from nine to twenty-one scales in each row. The bristles are wider apart on the costal margin than they are on the outer margin of the wing.

Many species of *Geometræ*—*Boarmia repandata*, *Hybernia leucophaea*, *Cheimatobia brumata*—rest with wings expanded, and touching the surface of tree trunk, branch, paling, or what not, on which the insect may be during day-time; but observe these same insects at night, either settled or in copulation, and the wings are erect. I have seen them so during the day-time, and remember, on at least one occasion, speculating as to why the erected wings were not blown apart by the strong wind which was blowing direct on to the edges. I would now suggest—in fact, it seems obvious—a function of the marginal bristles is that of fastening together the edges of the opposite wings when they are erect. It is probable that the normal action of the muscles at the base of the wings is to expand them, and the ability to keep them erect is largely helped by the marginal bristles.

Noctuæ—*Orthosia macilenta*, *Caotcala nupta*, *Mamestra brassicæ*—have the marginal bristles. *Mamestra (Melanchra) mutans* (N. Z. sp.), which I have just examined, has stronger bristles, with a more pronounced curve, than most *Geometræ*; in Noctuæ, however, the marginal bristles rise from the under surface of the wing. Clearly, the function ascribed to the bristles among *Geometræ* does not apply to the Noctuæ. Here is a problem which I will leave to anyone who feels sufficient interest in the subject, and will merely remark that the marginal bristles occur in both male and female of *Asaphodes megaspilata*, and is probably not a sexual character.

Palmerston North, New Zealand: Sept. 1st, 1900.

NOTES ON SOME RHYNCHOTA COLLECTED CHIEFLY IN
CHINA AND JAPAN BY MR. T. B. FLETCHER, R.N., F.E.S.

By G. W. KIRKALDY, F.E.S.

My friend Mr. Fletcher's very limited opportunities for entomological work while with H.M.S. 'Centurion,' on the China Station, were chiefly directed towards the acquisition of Lepidoptera, so that the Rhynchota, which he has kindly added to my collection, are but few in number, though of some interest. The following is a preliminary list. (P)=probably in Palæarctic region; (O)=probably in Oriental region. Castries Bay is just south of the mouth of the Amur; Kama Kura is close to Yokohama; Kornilof is in the north-east of Cho-sen (as, I believe, Korea ought properly to be termed); Leu-Kung-tao is an island near Wei-hai-wei; Port Lazareff, in Cho-sen, near Gen-san; and Pei-tai-ho, near Shan-hai-Kwan, in the Gulf of Leao-tong.

My thanks are due to my amiable friend, Dr. Arnold L. Montandon, who has been so kind as to examine the species marked with an asterisk (*).

Fam. TETIGONIIDÆ.

1. *Tetigonia ferruginea* (Fabr.). Cho-sen, Port Lazareff, Oct. 2nd, 1897 (P).

Fam. CERCOPIDÆ.

2. *Aphrophora* sp.? China, Castries Bay, Sept. 8th, 1896 (P).

Fam. CICADIDÆ.

3. *Pycna kæmpferi* (Fabr.). Japan, Yokohama, Aug., 1898 (P).
4. *Graptopsaltria colorata*, Stål. Japan, Yokohama, Aug. 1898 (P).
5. *Dundubia* (subg. *Cosmopsaltria*) *opalifera*, Walker. Japan, Kama Kura, Aug. 1898; China, Leu-Kung-tao, Aug. 1898 (P).
6. *Cicada bihamata*, Motschulsky. Japan, Hakodate, Aug. 1897 (P).
7. *Cicada flammata*, Distant. Japan, Hakodate, Aug. 1897 (P). As Mr. Distant was acquainted with the female only (Mon. Orient. Cicad., p. 99, pl. 13, fig. 15), the following details are added. Belongs to Distant's section A. a. bb., and looks somewhat like a large broad *bihamata*, being perhaps intermediate between the latter and *leechi*, Dist. Anterior femora armed with two very strong spines; opercula reaching beyond the middle of the abdomen, overlapping interiorly, rounded apically. Last two "abdominal" dorsal segments spotted with reddish-ochraceous, first genital segment above not spinosely produced in the middle.
8. *Cryptotympana pustulata* (Fabr.). China, Wei-hai-wei, July 16th, 1898 (P).

9. *Cicadetta*, n. sp.? Japan, Kornilof, July 9th, 1899 (P). Almost certainly a new species, but only one female in the collection; allied to *C. pellosoma* (Uhler), from China.

Fam. FULGORIDÆ.

10. *Geisha distinctissima* (Walker) (P).

11. *Pyrops* [= *Fulgora*, auct.] *candelarius* (Linn.). China, Hongkong, Mar., 1898, April 22nd, 1899; Kaulung, Dec. 1898 (O).

Mr. Fletcher has been good enough to send me a copy of his observations on this insect, recorded at the time in his Journal: "Sometimes they were on the trunk [of the tree], with which they harmonize very well, and sometimes high up in the branches; in the latter case, they are easily beaten out, and then fly quite a distance, their vivid yellow hind wings rendering them very conspicuous on the wing. . . . A tree at the top of the [Botanical] Gardens [at Hongkong], with a Chinese coolie gesticulating under it, attracted" Mr. Fletcher's attention, and he found a pair of *candelarius* "settled on a branch, with whose environment they harmonized well." Mr. Fletcher insists on the harmony of *candelarius* with its environment, but Mr. E. E. Green's account of the Sinhalese *maculatus* is very different. "Our *Pyrops maculatus* is a very conspicuous insect, when at rest, and takes no measures to conceal itself, trusting to its marvellous agility" (E. E. Green *in litt.* Aug. 22nd, 1900).

Mr. Fletcher also tells me that the people at Kaulung had never heard of *candelarius* being luminous. I asked him also if he could afford any solution as to the use or purpose, if any, of the cephalic prolongation, and if this were any assistance in flying, but Mr. Fletcher emphatically denies this. "When alive, the long 'nose' is quite soft and fleshy, and they do not seem to mind bending it up at all, as it straightens out again afterwards. They walk almost on the tips of the two first pairs of legs, with the head up, keeping the third pair close to the body, and with these they can give a long leap, the wings then sustaining the flight" (Journal, *in litt.* Dec. 10th, 1898); and again, "Generally speaking, they fly up into the leaves, high up, when disturbed. They use their legs awkwardly, and walk in a *gingerly* kind of way. I found that on a flat surface, such as a desk, they could leap about three feet with the hind legs. . . . They are very wary and suspicious when settled, and are easiest to catch on the wing, or, better still, just when they have settled, before they have got their bearings, so to speak" (*in litt.* July 5th, 1900). Mr. Fletcher suggests that the cephalic prolongation may possibly serve to resemble a twig of the tree on which it is resting.

Fam. BELOSTOMATIDÆ.

12. **Amorgius deyrollii* (Vuillefroy). China, Yang-tze-Kiang, Aug., 1898.

13. **Amorgius indicus* (Lep.-Serv.). Siam, Bangkok (O), flew to light on board the 'Centurion,' about twenty miles from land, Dec. 3rd, 1899.

Fam. NEPIDÆ.

14. **Nepa cinerea*, Linné. China, Chi-fu, May 9th, 1899, in a stream (P).

15. **Ranatra unicolor*, Scott. China, Pei-hai-to, Sept., 1898 (P). Dr. Montandon remarks:—"Cette espèce est bien voisine de *R. vicina*, Sign., mais en diffère par les yeux plus globuleux, aussi longs que larges, moins transversaux, l'espace interoculaire un peu plus rétréci; les deux épines du milieu du fémur antérieur plus espacées; l'extrémité du fémur antérieur non épineux. Les pattes, les élytres et le métasternum sont conformés de façon à peu près identique. Chez *R. vicina*, Sign., les deux épines du fémur antérieur situées à l'extrémité du tibia au repos sont presque sur le même plan transversal" (*in litt.* Oct. 11th, 1900).

16. **Ranatra chinensis*, Mayr. Cho-sen. Dr. Montandon writes me:—"J'ai aussi dans ma collection un exemplaire semblable du Japon reçu jadis de MM. Staudinger, sous le nom de *Ranatra princeps*, Westw., nom que je ne connais pas et qu'il faudrait vérifier" (*in litt.* May 19th, 1900). The publication of this name is unknown to me also.

Fam. GERRIDÆ.

17. *Metrocoris lituratus* (Stål). China, Hongkong. "Common in pools and streams on the hills," but only one pair captured, March, 1899 (O).

18. *Gerris fletcheri*, sp. n. Very closely allied to *G. najas* (De Geer), Kirk. [*paludum* (Fabr.), auctt.], but is scarcely so robust, and a trifle longer. The general structural characters are those of *najas*, but the second segment of the antennæ is distinctly longer, in proportion to the third, than in that species, and, in the female, the first genital segment is wider in proportion. In colour, the pronotum is more or less rufescent, and the elytra are pale fuscous, dirty whitish at the base, with dark brown nervules. Had *najas* (*paludum*†) been recorded from Siberia or Japan, I would probably have regarded this as a local form of it, but it seems to be sufficiently distinct by the characters given above.

China, Wei-hai-wei, May 20th, 1899 (P). I have great pleasure in naming this addition to the Palearctic fauna after Mr. Fletcher.

Fam. REDUVIIDÆ.

19. *Peirates*, sp. China, Wei-hai-wei, May 27th, 1899.

† I have demonstrated in Entom., 1899, p. 203, that the true *najas*, De Geer, is identical with *paludum*, Fabr.; the *najas* of authors is *canalicum*, Dufour.

Fam. GEOCORIDÆ [= LYGÆIDÆ, auctt.].

20. *Dindymus sanguineus* (Fabr.). China, Hongkong, March, 1899 (O).

21. *Physopelta gutta* (Burm.). China, Hongkong, March, 1899. Common on trees (O).

22. *Geocoris colon* (Fieber). China, Wei-hai-wei, June, 1899 (P).

Fam. LYGÆIDÆ [= COREIDÆ, auct.].

23. *Myodocha varicornis* (Fabr.) [*Leptocoris* v. auct.]. China, Hongkong, March, 1899. On a small flower above the cemetery in Happy Valley.

24. *Mictis profana* (Fabr.). Australia, Sydney.

25. *Megalotomus*, ? sp. In company with (probably mimicking) ants. China, Wei-hai-wei (P).

Fam. CIMICIDÆ.

26. *Tectocoris lineola* (Fabr.). Australia, Sydney.

27. *Tessarotome papillosa* (Drury). China, Hongkong, Dec., 1898 (O). Mr. Fletcher writes me, that when attempting to capture this, the bug, which was then about sideways to him, squirted some fluid into his right eye, the somewhat considerable pain lasting about half an hour. He also writes: "When irritated, it quivers its antennæ rapidly, emits a most powerful odour [from the thorax], and squeaks plaintively."

28. *Pycnum rubens* (Fabr.). Labuan, Oct. 25th, 1899 (O).

29. *Catacanthus nigripes* (Sulz.). Australia, Sydney.

30. *Dictyotus vilis* (Walker). Australia, Sydney, Jan., 1898. Agrees with examples received from New Zealand, from Mr. Ambrose Quail, F.E.S.

31. *Philia senator* (Fabr.). Australia, Sydney.

32. *Cantao ocellatus* (Thunb.). China, Hongkong, Mar., 1899 (O). A little smaller and darker than Western oriental forms.

33. *Graphosoma rubrolineatum*, Hope. Cho-sen, Korniloff, Aug. 9th, 1899 (P).

NOTES AND OBSERVATIONS.

EMERGENCE OF *DREPANA BINARIA* (*PLATYPTERYX TRAMULA*) EXTENDING OVER THREE MONTHS.—In June of last year I obtained ova of *P. hamula* from a captured female, and succeeded in rearing seven larvæ to the pupal stage. From these pupæ two males emerged on Aug. 1st and 4th; four more emerged on Nov. 9th, 14th and 26th, and Dec. 19th. The pupæ have been kept in an open box out of doors, I shall be glad to know if this prolonged emergence is unusual, and if any of your readers have had a similar experience.—LEONARD A. SPENCER; 52, Burghley Road, Highgate Road, N.W., Jan. 5th, 1901.

THE STRIDULATION OF CORIXA.—I received, by the kindness of the author, a copy of Anton Handlirsch's "Zur Kenntniss der Stridulationsorgane bei den Rhynchoten" (1900, *Annalen Naturh. Hofmus.*

Wien, pp. 127–141; 1 plate and 15 text-figures), but, unfortunately, it was too late to stop my own brief communication last month (page 9), or to add a footnote. As Handlirsch's conclusions do not altogether accord with mine, I hope very soon to discuss his valuable and interesting paper.—G. W. KIRKALDY.

SWAMMERDAM ON THE DRAGONFLY NYMPH.—In connection with Mr. Calvert's note in Entom. xxxiii. p. 350, it is interesting to find that Swammerdam wrote in 1680:—"The limbs (*i. e.* of the dragonfly nymph) come out of the egg imperfect." He further states that he does not know how long a period elapses between the laying of the egg and its hatching, nor how long the nymph-stage lasts, though he thinks the latter is two years—a result which Mr. East arrives at in the case of *Æschna cyanea* (see Entom. xxxiii. p. 258). The insect that Swammerdam subjected to examination appears to have been a species of *Gomphus*. I have made use of the English translation of his work, 'Biblia Naturæ,' by Dr. J. Hill, in 1758. By the way, eggs of *Symptetrum striolatum* hatch in captivity in three or four weeks.—W. J. LUCAS; Kingston-on-Thames.

NOTES ON BRITISH DRAGONFLIES.—*Ischnura pumilio*. This pretty little dragonfly was taken by my father, near Lyndhurst, in August, 1820; on Parley Heath, June 18th, 1824; on Knighton Heath, near Dorchester, in July, 1835; at Glanvilles Wootton (two only), Aug. 17th, 1859. In a bog near Land's End (commonly), in August, 1864, by my father and myself; at Lodmore, near Weymouth (one specimen at least), in May, 1887, by myself. It is recorded by Mr. Henry Doubleday as occurring in old gravel pits at Epping (Ent. Monthly Magazine for 1871–1872, p. 87). It has also been reported from Cambridgeshire and Ireland (see De Selys Longchamps' paper on British Libellulidæ in 'Annals of Natural History' for 1846).—*Agrion mercuriale*. One taken by my father, in the New Forest, on June 12th, 1832; subsequently, at Winchester, on June 17th, 1832; and at Cosmore Quay, about two miles from here, on July 1st, 1839, and July 6th, 1844.—*Æschna rufescens (isosceles)*. This grand fellow was taken by my father, at Whittlesea Mere, on June 22nd, 1818, and July 18th, 1827, by Mr. Sparshall, at Horning, on Aug. 5th, 1824. It has also been reported from Halvergate and Yarmouth. The latter is probably a mistake, as the species is omitted from Paget's 'History of Yarmouth.'—*Libellula veronensis*. Mr. Lucas gives this as = *S. scoticum* (see Entom. xxxiii. p. 260). I possess the specimen, and it decidedly is not *scoticum*, but the true *vulgatum*. De Selys Longchamps saw it in August, 1851, and told my father he was right. It was taken at Hull by Mr. Harrison.—*Agrion zonatum* (Entom. xxxiii. p. 260) is *cyathigerum*. The late Baron de Selys came over to England to view the collection, specially of Curtis and Evans, and as the result, wrote a paper on the British Libellulidæ in the 'Annals of Natural History' for 1846, vol. xxiii.—C. W. DALE; Glanvilles-Wootton, Nov. 3rd.

[Of the distribution of *Æ. isosceles (rufescens)* must give way to the prior name), *I. pumilio*, and *A. mercuriale*, a summary will be found in my 'British Dragonflies,' pp. 213, 270, and 297. The older captures of Mr. J. C. Dale and others, though mentioned there as being

extremely interesting, are of little practical use to the present-day field naturalist. There are, however, two by Mr. C. W. Dale himself—of *I. pumilio*, near Land's End, in 1864, and of the same insect near Weymouth in 1887—but a later search in the latter locality only revealed *I. elegans*; while, if my memory serves me rightly, Mr. C. A. Briggs sought in vain for *pumilio* at Land's End. Of course, this does not prove that the last is not now to be found in these two localities, for, besides the fact that *pumilio* is a very inconspicuous insect, both species of the genus may fly together, as is the case in the locality discovered last season in the New Forest. By the way, this can scarcely be the part of the forest in which Mr. J. C. Dale took *pumilio* in 1820—it is too far from Lyndhurst. With regard to *veronensis* (Entom. xxxiii. p. 260), the name given by Curtis is *Lib. veronensis*, Charp., and the *veronensis* of Charpentier is certainly *Sympetrum scoticum* (vid. Lib. Eur. p. 85 and pl. xii.). De Selys, in his 'Revue des Odonates' (1840), says:—"Je n'ai pas vu l'exemplaire pris à Hull en Angleterre et cité sous le nom de *veronensis* par M. Curtis; mais M. Dale, qui le possède, m'écrira que c'est probablement la vraie *vulgata*, d'après la forme de l'écaille vulvaire." (See also Ann. Nat. Hist. 1846.) As it appears the insect was examined afterwards (in 1851) by De Selys, it is a pity his opinion seems never to have been published, especially as three specimens of *S. vulgatum* have been taken in England during the last few years.—W. J. L.]

EVENING FLIGHT OF BUTTERFLIES.—In reply to Mr. Blenkarn's query (*ante* p. 26) as to the twilight flight of *Pyrameis* (*Vanessa*) *cardui*, I should say it is not a very unusual occurrence. I have few back volumes of the magazines at hand to refer to now, but I think that Mr. E. F. Studd, amongst others, has recorded taking this species and *P. atalanta* in his moth-trap at night. Indeed, the *Vanessids* especially seem to have a tendency to nocturnal flight. On July 19th, 1899, when we were at Korniloff, in Korea, a specimen of *Vanessa v-album* came off to the ship, attracted by light; and in 1897, when we were there, I took three specimens of the same species at light on board; these all came to light about ten p.m. It struck me as a strange thing that I never saw any on shore there in the day-time, though it must have been fairly common. At home, of course, we look on butterflies as essentially creatures of the sun, but it must be remembered that in many genera abroad the species fly only at twilight; at Hongkong, for example, though I have taken *Lethe europa* on the wing in the day-time, I have found that its flight is much swifter in the evening after sunset, and it seems, so to speak, much more at home on the wing then.—T. B. FLETCHER; H.M.S. 'Gladiator,' Mediterranean Station, January 12th, 1901.

XYPHIDIA CAMELUS.—This rare sawfly was taken by my father, in the New Forest, on June 23rd, 1840. My other specimens were taken by Mr. Serrel, in the Isle of Man. Mr. Wailer used to find it common at Newcastle. It probably still exists in the New Forest, and only awaits re-discovery, like *Ischnura pumilio* and *Mecostethus grossus*.—C. W. DALE.

INSECT FAUNA OF MIDDLESEX.—I shall be greatly obliged if any collectors who have made observations and captures of Lepidoptera, or

any other orders, will send me their lists, with a view to assist in a compilation of records for Middlesex (only), particularly in the south-western districts of the county.—H. ROWLAND-BROWN; Oxhey Grove, Harrow Weald, Middlesex.

NEW WORK ON BRITISH DIPTERA.—The first volume of 'British Flies,' by G. H. Verrall, President of the Entomological Society of London, was issued on January 1st of the present year. The work when completed will extend to some fourteen volumes. The book now before us is vol. viii., and treats of the Platypezidæ, Pipunculidæ, and Syrphidæ. A more extended notice will be given in the next number of the 'Entomologist.'

LIST OF BRITISH SPIDERS.—The Rev. H. Pickard-Cambridge, author of the 'Spiders of Dorset,' has recently published a 'List of British and Irish Spiders.' We have much pleasure in introducing this useful brochure to the notice of all who are interested in British Araneidea.

ORTHOPTERA.—Redtenbacher has published a monograph of the Orthoptera of Austria-Hungary and Germany, with general notes on the structure and development; collection and preparation of specimens, literature, analytical tables, and descriptions, &c., of the species. ('Die Dermapteren und Orthopteren von Oesterreich-Ungarn und Deutschland.' Vienna, 1900. 148 pp. and one Plate.) A detailed notice will appear later.—G. W. K.

REVISED LIST OF CHESHIRE LEPIDOPTERA.—The President of the Chester Society of Natural Science has appointed a small committee, consisting of Mr. J. Arkle, Dr. Herbert Dobie, Mr. R. Newstead, and myself, to revise and extend Mr. A. O. Walker's List of the Macrolepidoptera of the district, published in 1885. The district will now comprise Cheshire, Flintshire, Derbyshire, Carnarvonshire, and Anglesea. I should be much obliged to any one interested in the entomology of these counties, especially the Welsh ones, if they will send me records or notes; and I will supply lists for marking to those who may apply to me for the same.—Geo. O. DAY; Knutsford, Cheshire, January 22nd, 1901.

CAPTURES AND FIELD REPORTS.

ACHERONTIA ATROPOS IN SUFFOLK.—It may be of interest to record the capture of twenty-six larvæ of *A. atropos* at Stowmarket, Suffolk, during July and early part of August last, by my friend Herbert Graves of that town. They were found chiefly on the tea-vine. They pupated in flower-pots, which he placed on the top of a steam-boiler, and on Sept. 28th, 1900, the first imago emerged; they continued coming out till the end of October, viz. fifteen perfect imagos, eight cripples; there were also two dead pupæ, and one pupa is lying over. My friend sent me on six perfect insects, one fine female measuring $5\frac{1}{2}$ inches across the wings; the others are also very fine.—H. W. BAKER; 20, Alsen Road, Holloway, London, N.

ACHERONTIA ATROPOS IN N. STAFFORDSHIRE.—*A. atropos* has been abundant in the larval and pupal stages in the Market Drayton district this autumn. About twenty larvæ were brought to me, and nearly two hundred pupæ, by men digging potatoes. One hundred and seven were found and

brought me from one farm. This, of course, represents only a small proportion of the actual number of pupæ, as the machine only turns over the ridges without disturbing the furrows.—F. C. WOODFORDE.

COLIAS EDUSA IN N. STAFFORDSHIRE.—On Sept. 13th I saw and captured a male *C. edusa*. This was the only specimen I personally saw, though I heard of several being seen by others in the neighbourhood.—F. C. WOODFORDE.

COLIAS EDUSA IN N. WALES.—In the first fortnight of June I saw two or three female *C. edusa* on the Carnarvonshire coast. I caught and examined a couple and set them free.—F. C. WOODFORDE.

COLIAS EDUSA IN 1900.—A few specimens of *C. edusa* have occurred in this neighbourhood. One was seen by my wife in our garden at Newtown towards the end of July; and several more turned up a couple of miles further up the Severn valley. On Aug. 31st I saw a fine male on the roadside, on the border of Montgomeryshire and Salop. I also observed specimens of this butterfly near Northampton, in August; and one male specimen in Lincolnshire, near Brigg, on Sept. 12th.—A. S. TETLEY; Newtown, N. Wales, Dec. 15th, 1900.

MACROGLOSSA STELLATARUM AT CRANBROOK, KENT.—This species was again very common during last season; several could be seen at once on a large bed of scarlet geraniums and a large bed of petunias, in a nursery garden near here. A specimen was seen as late as Nov. 27th, although the early part of the month had been very wet and windy.—A. MARSHALL; Cranbrook, Kent, Jan. 18th, 1901.

NONAGRIA NEURICA VAR. *DISSOLUTA*, *Treitschke*.—Several examples of this black variety of *N. neurica* were taken in the neighbourhood of Needham Market, Suffolk, in August last. This is a fresh locality, I believe, for this species. The Rev. E. N. Bloomfield, in his Catalogue of the Lepidoptera of Suffolk, gives Lakenheath and Lowestoft only, and says it is local and rare.—GERVASE F. MATHEW; Dovercourt, Essex, Jan. 9th.

HEMEROBIUS STIGMA (LIMBATUS) IN DECEMBER.—On Dec. 16th last, I took from a small fir-tree on Esher Common, a single specimen of *H. stigma*. It was rather small, and the wings somewhat darker than usual. It must, I suppose, be looked upon as an early arrival owing to the mild weather, rather than a late survival.—W. J. LUCAS.

CHEROCAMPA NERII IN SCOTLAND.—Mr. And. Adie Dalglish, of Pollockshields, records a specimen of this fine hawk-moth as having been taken by "a farm servant, who saw it alight on a sheaf of corn in a field near Barrhead, about the end of September." He adds that a specimen, previously recorded, was taken in September, 1886, at Glasgow (Ann. Scott. Nat. Hist., No. 37, p. 52).

CLEORA GLABRARIA IN SCOTLAND.—Referring to the note under this heading, *ante*, p. 21, it may be worth recording that I have taken this species several times in Argyllshire during the last four years, in each case during the first fortnight in August. These Scotch specimens do not appear to differ in any respect from those I have taken in the New Forest. JOHN A. NIX; 20, Hans Place, S.W.

VANESSA POLYCHLOROS IN 1900.—I have not seen in any of the magazine notices of 1900, with the exception of the 'Entomologist,' that *V. polychloros* has attracted any attention. This appears to me curious, for although of late years it has scarcely been seen where formerly it occurred pretty freely, in East Kent last season it was far from uncommon: Folkestone, Dover, Shepherdswell, Wingham, Walmer and Deal, Sandwich, Margate, Canterbury, have all to my knowledge yielded specimens, and in most cases series, to net wielders; and friends have informed me that it has been common at Norwich, Surrey, Hants (New Forest), and Devonshire too.—SYDNEY WEBB; 22, Waterloo Crescent, Dover, Jan. 3rd, 1901.

VANESSA ANTIOPA IN SURREY, 1900.—I am able to add one more to the list of captures of *V. antiopa* during 1900. A very poor specimen was caught on a window at Englefield Green, Surrey, about Sept. 1st. It was given to a boy of seven years old, who had no collection, as a "Purple Emperor." When I saw it, a fortnight ago, it was indeed a pitiable sight, with a large needle through it and wings on only one side: the *bits* of the other wings had been kept—no antennæ. Though in this bad state, there was no mistaking it, and I, having patched it up as well as possible, have it now in my cabinet.—L. M. SETH-SMITH; Alleyne, Caterham Valley, Surrey, Jan. 11th, 1901.

VANESSA URTICÆ.—A specimen of *V. urticæ*, in good condition, suddenly appeared in the dining-room of a house here, on the evening of Dec. 26th, having probably been brought in with the evergreens used for decoration. We have also one example of the same species, at present on the wall of the stairwell in this house, where it has been since the end of September last.—A. MARSHALL; Windmill Hill, Cranbrook, Kent, Dec. 28th, 1900.

VANESSIDS IN 1900.—In reply to Mr. Adkin's note (*ante*, p. 17) I give the following notes of my captures. I took a number of pupæ of *V. polychloros*, suspended from tar-covered palings near Winchfield in Hants, on July 6th last, the majority of which emerged on July 16th. I also took a number of *V. polychloros* pupæ, suspended from the round rails of iron hurdles at Shoreham, Kent, on July 12th; imagos emerged on July 22nd; one was ichneumonised, a large number of flies emerging. I found *V. cardui* plentiful at Margate, Sept. 18th, flying in a lucerne field, at Crayford, on railway banks (one female full of eggs); on Sept. 7th, at Sandwich; Sept. 25th, in the lanes, at Deal; Sept. 26th, at Hythe; Oct. 2nd, in lanes; and at Worcester Park, Surrey, on July 30th. I have noticed that certain of the Vanessids seem to enjoy the neighbourhood of brick-works and gas-works, but cannot understand what it is that attracts them, unless it be the vile smells they find there. They are very fond of settling on the cinders used in brick-making, and when driven off will return to them, in preference to settling on flowers or mother earth, and there sun themselves. *V. atalanta* I found not so plentiful as in 1899, although I had been on the look-out every day in the week, right through the season. *V. io*: I have seen odd specimens at Hythe, Aug. 31st, and at Margate, Oct. 18th.—C. W. COLTHRUP; 127, Barry Road, East Dulwich, S.E.

I did not see, in this district, a single specimen of either *Vanessa cardui*, *V. io*, or *V. polychloros*, although *V. atalanta* was very common up to Oct. 7th, on the over-ripe fruit in this neighbourhood, where baskets of

plums, &c., were allowed to rot under the trees.—A. MARSHALL; Cranbrook, Kent, Jan. 18th, 1901.

V. atalanta has been abundant in the autumn here during the last few seasons. *V. (Pyrameis) cardui*: a few were seen in 1897. *V. io* has always been very scarce; in fact, during the last twenty-two years I have only seen four specimens. *V. (Aglais) urtica* is generally abundant every year.—G. B. ROUTLEDGE; Tarn Lodge, Headsnook, Carlisle, Jan. 8th, 1901.

V. atalanta during the past season has been more than ordinarily abundant in the neighbourhood of Carlisle, and also in the district round Lazonby, in the south-east of Cumberland. Not since 1894 have I seen it so plentiful. *V. io* has hardly been seen for a good many years until last season, when several were seen or taken near Carlisle, and near Maryport on the coast it was not uncommon, so that it is hoped that this fine species is about to re-establish itself with us. Twenty or more years ago it was, I believe, almost as common as *V. urtica*.—T. H. DAY; Carlisle, Jan. 7th.

Referring to Mr. Atkin's note (*ante*, p. 17), the following observations from Lewes and district may be of interest. The past season has been marked by an abnormal abundance of *V. atalanta*, while *V. (Cynthia) cardui* has occurred in tolerable numbers. *V. io* appears to have almost completely disappeared from the neighbourhood, since in places where it was formerly plentiful I have hardly seen a specimen for the past six years. The late Mr. Watkins, of Eastbourne, informed me that he had noticed the same in reference to the Eastbourne district. *V. polychloros*, formerly also plentiful, is now but seldom seen. I have only noticed two specimens during the past six years.—HUGH J. VINALL; Lewes.

EARLY APPEARANCE OF PHIGALIA PEDARIA (PILOSARIA).—I took a fine male (black variety) off a gas-lamp on Dec. 16th last.—W. FEATHER; 7, Harding Houses, Crosshills, Yorks.

LATE BUTTERFLIES.—I see, on referring to my notes, that I captured a male *Euchloë cardamines* on Aug. 4th, 1879. *Pararge egeria* I saw on Oct. 16th the same year. *Grapta c-album* was in my garden on Nov. 2nd this year, and at the end of the month *Pieris rapæ* was seen, on two occasions, near this city. Several days during the month were as warm as at the end of September; violets and primroses in plenty in the open.—J. B. PILLEY; Hereford, Dec. 18th, 1900.

NOTES FROM CRANBROOK, KENT.—The number of butterflies in this district seems to me to be on the decrease, and I believe this is, partly at least, attributable to the keenness of our up-to-date agriculturists for "hedge-brishing," which means that, when the hay and corn has been carried, all the hedges are trimmed up, and the herbage from the banks and ditches cleared away. These "brishings" are either burnt or thrown into the cattle-yards, which must mean the destruction of a lot of ova, larvæ and pupæ. Specimens of *Pieris napi* were in good condition up to Oct. 7th; many of the late females had the under side of the secondaries a beautiful bright lemon-yellow colour. *Gonepteryx rhamni*, *Vanessa urtica*, and *Polyommatus phlæas* were also common here up to end of September. One specimen only of *Colias edusa* seen, on Aug. 11th. Re *V. cardui* (*ante*, p. 26), one autumn, some few years ago, I several times saw specimens flying round oak-trees on some high ground near here, after sunset.—A. MARSHALL; Cranbrook, Kent, Jan. 18th, 1901.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—*December 5th, 1900.*—Mr. G. H. Verrall, President, in the chair. Mr. Jacoby exhibited specimens of *Hypocephalus armatus* from Bahia and *Chrysomela salisburyensis*, a new species, from Mashoualand.—Mr. Bower exhibited a specimen of *Spilosoma montanum*, an Asiatic species, bred from a larva found at the beginning of September, 1897, feeding on birch on a moor near Paisley. The larva hibernated and spun a cocoon the following spring, not feeding after hibernation. Moth bred June 2nd, 1898. The larva was given to Mr. Wm. Smith, of Paisley, by a friend who found it on a moor used by the Glasgow Corporation for rubbish, the supposition being that the ovum or larva had been introduced with the refuse matter.—Mr. McLachlan exhibited a female of a Dragonfly of the genus *Tetracanthagyna*, from North Borneo, similar to *T. vittata*, McLach., but with a very broad ante-apical fascia on the wings, and with some asymmetrical markings. He said there might be a question as to the specific identity or otherwise of the insect. And there was also the question as to whether the insect described by Mr. C. O. Waterhouse as *Gynacantha plagiata* in the 'Transactions' for 1878 was specifically the same. Mr. Waterhouse was of opinion that the species was distinct.—Mr. R. Adkin exhibited two aberrant male specimens of *Argynnis aglaia*. In one of them the basal two-thirds of all the wings were almost completely covered with black, and broad black streaks crossed the remaining third of the wings to the outer margin, following the venation. In the other specimen the peculiarity consisted in the presence of a greenish-white blotch on each of the wings on the left side, similar in character to the pale blotches not infrequently observed in *A. paphia*. Both specimens were taken near Brighton in July last, where the species was unusually abundant.—Papers were communicated, on "Observations on some species of *Orina*, a genus of viviparous and ovo-viviparous beetles, by Mr. G. C. Champion and Dr. T. A. Chapman," reported by Dr. T. A. Chapman; "Illustrations of the sixth male ventral segment in seventeen *Osmia* species of the *Adunca* group, with a note on the synonymy of three species, and descriptions of five which appear to be new," by the Rev. F. D. Morice, M.A.; and an obituary notice of the late Dr. Otto Staudinger, by Mr. H. J. Elwes, F.R.S.—C. J. GAHAN and H. ROWLAND-BROWN, *Hon. Secs.*

Wednesday, January 16th, 1901.—The sixty-eighth annual meeting. Mr. George H. Verrall, President, in the chair. After an abstract of the Treasurer's accounts, showing a large balance in the Society's favour, had been read by one of the Auditors, the Secretary read the Report of the Council. It was then announced that the following had been elected Officers and Council for the Session 1901-1902. President, the Rev. Canon Fowler, M.A., F.L.S.; Treasurer, Mr. Robert McLachlan, F.R.S.; Secretaries, Mr. Herbert Goss and Mr. H. Rowland-Brown; Librarian, Mr. George C. Champion; and as other members of the Council, Professor T. Hudson-Beare, F.R.S.E., and Messrs. R. Adkin, Charles G. Barrett, William L. Distant, H. St. J. Donisthorpe, Charles J. Gahan, Robert W. Lloyd, Edward Saunders, G. H. Verrall, and Colbran J. Wainwright.—The President referred to the losses the Society had sustained during the past session by the

deaths of Mr. Spence, the Baron de Selys-Longchamps, Mr. Blatch, Major George Cockle, Mr. Philip Crowley, Lord Dormer, Mr. J. H. Leech, Dr. W. H. Lowe, Professor Joseph Mik, Professor Emile Blanchard, Dr. Staudinger, and other entomologists. He then delivered an address.—A vote of thanks to the outgoing President was proposed by the Rev. Canon Fowler, seconded by Colonel Swinhoe, and carried.—H. Goss and H. ROWLAND-BROWN, *Hon. Secs.*

SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—*November 8th.*—The President in the chair. The Annual Exhibition of Varieties was held on this evening, and was a most successful and interesting meeting. Mr. B. Adkin, a bred *Vanessa (Eugonia) polychloros* with a very pale ground colour; a *Triphæna jimbria* having the black band on the hind wings extending along the inner margin; and examples of *Catocala promissa* with paler upper wings, and hind wings with narrow and straight median band. Mr. Winkley, *Catocala nupta* var. *cærulescens*, taken in August, 1892. Mr. R. Adkin, varieties of *Argynnis aglaia* (1) with basal two-thirds black, except a yellow discoidal spot (on the under side the silver spots were reduced to two on each hind wing; (2) with greenish blotch on both left wings, similar to those frequently found in *A. paphia*; (3) with black spots on the central portion of the under side run together into irregular bands; (4) two unusually dark females, one having an unpigmented patch on both left wings; also a long series of *Melanippe galiata*, showing extreme variation in the width and intensity of the band. Mr. Urwick, a graduated series of variations of *Abraxas ulmata* from smoke-coloured to almost white; hermaphrodite var. of *Argynnis paphia*, having the right wings var. *valezina*, and the left wings ordinary male type, except a few dark splashes; a suffused var. of the same species; several vars. of *Lithosia quadra* showing variation in depth of colour and absence of spots; a sagittate variety of *Epinephele hyperanthus* and grey forms of the same species; a richly banded form of *Ephyra pendularia*; and sixteen very striking varieties of *Chelonia plantaginis*, showing a complete gradation between the extreme form with pure white ground colour and black markings to a much intensified form of var. *hospita*, being an inbred series. Mr. Nevinson, *Malacosoma castrensis* showing extreme variation; a light form of *Lasiocampa trifolii*; light and dark forms of *Cosmotriche potatoria*; *Arctia caia* with radiated black markings on hind wings; hybrids *Pygæra curtula* × *T. pigra*; light and dark *Heliothis peltigera*; a banded form of *Zonosoma linearia*; and extreme light and dark forms of *Melanippe fluctuata*. Mr. F. M. B. Carr, an example of *Diloba cæruleocephala*, in which the 8-mark is represented by two small spots; a *Coremia propugnata (designata)* with a very narrow brown transverse band, and one without a trace of the flame colour; and a male *Malacosoma neustria* with scarcely any sign of the pale transverse lines. Mr. H. J. Turner, a series of *Callimorpha hera*, taken in August at Dawlish, showing a complete gradation in colour between the rich red of the type, through the terra-cotta form to the brilliant yellow form, var. *lutescens*; and a very long and varied series of *Bryophila muralis (glandifera)* from the same place, remarkable in all the forms being dark, many of a rich yellow brown coloration, most with black markings conspicuous, and in all the hind wings were dark, and in some very dark. Mr. Adkin and Mr. Colthrup, series of the

latter species from Eastbourne and Folkestone respectively to compare with them. In Mr. Colthrup's series was a specimen with the "cottage-loaf" mark cut asunder by a broad streak of black, a most unusual form. Mr. Lucas, a series of nine *Libellula quadrimaculata*, showing a complete gradation between the type and an extreme example of the var. *prænubila*. Mr. Chittenden, a large number of varieties taken or bred mostly from Kent, including *Bupalus piniaria*, right side female, left side male coloration; dark brown *Drepana fulcula*; red, dark, and light forms of *Taniocampa gracilis*; dark and light forms of *Pachetra leucophæa*; *Phigalia pedaria*, dark vars.; *Hybernina marginaria*, intermediate forms and var. *fuscata*; and extreme light and dark forms of *Cidaria immanata*, *Aplecta prasina*, *Xylophasia monoglypha*, &c. Dr. Chapman, a number of specimens of several European species of the genus *Erebia*, to show that the most well-marked forms tend to have black spots with a white pupil in each marginal cell, set in a bright brown band, which may invade a considerable area of the wing; while at the other extreme the dark ground colour may cover the whole wing to the exclusion of all the spots. Mr. J. P. Barrett, to show variation in size, (1) *Colias hyale*, one $2\frac{1}{8}$ in., another $1\frac{1}{4}$ in. in expanse; (2) *Ennomos alniaria*, one $2\frac{1}{8}$ in., another $1\frac{1}{8}$ in. in expanse; a pure yellow var. of *Aspilates citraria* without lines; and a specimen of the spring brood of *Agrotis putris*. Mr. H. Moore, forms of *Papilio machaon* from Greece, India, the Amur, and Japan (var. *hippocrates*); and a series of *P. xuthus* from China and Japan. Mr. A. Harrison, long and varied series of *Xanthia aurago*, *Miselia oxyacanthæ* with var. *capucina*, and *Scopelosoma satellitia* taken at sugar near Chingford in October. Mr. Main, two *Colius edusa* var. *helice*, bred from ova laid by a female *helice* taken at Hanwell. Mr. Mera, dark varieties of *Abraxus grossulariata*; and a *Cænonympha pamphilus*, having the left wing on the under side of the colour of the upper wing. Rev. J. Tarbat, very dark *Hybernina defoliaria*, small and varied *Tanagra atrata*, and bred *Stauropus fugi* from spring ova. Mr. Kemp, *Epinephele hyperanthus* (1) with apical ocelli wanting, (2) a bleached variety; and a similar variety of *E. tithonus*. Mr. Nicholson, *Catocala sponsa*, with left upper wing entirely suffused with umber-brown; *Pararge egeria*, a bred specimen thinly scaled with obscure markings; *Pieris rapæ*, with an indistinct spot on the disc of the hind wings; *Mamestra brassicæ*, of a uniform shiny leaden grey colour; and a series of *Melanippe fluctuata*, including var. *costovata*, and several banded forms resembling *M. sociata*. Mr. Cole, *Catocala nupta* var. *cerulescens*, taken on sugar at Brondesbury; and a var. of *C. hyale*, with a broad elongated splash of black on the under side of the fore wings. Mr. Kirkaldy, long series of various species of waterbugs, especially *Notonecta glauca* and var. *maculata*, to show colour variation, and how unreliable it is as a specific character. Mr. Kaye, a specimen of *Papilio machaon*, with the submarginal band of the fore wings internally edged with a broad black band, and with the discoidal spot enlarged into a blotch uniting with the band; and a specimen of *Hydrocampa stagnalis*, with several of the transverse markings much diminished or obsolete. Mr. Buckstone, *Polyommatus icarus*, female, with blue right upper wing, and a specimen smaller than *Cupido minima*. Mr. Newman, *Smerinthus ocellatus*, variety; dark forms of *Ennomos* (*Eugonia*) *fuscantaria*; and a red form of *Noctua neglecta*.

Mr. Brooks, bred *Acherontia atropos*, with a very pale variety, and one with very broad and dark markings; a *Pyrameis atalanta* with a pale border on one hind wing; a black fringed *Spilosoma radiata*; a very varied series of *Melanippe hastata*; and living pupæ of the first named, which he distributed to the members.

November 22nd.—The President in the chair. Mr. Cane, of East Dulwich, was elected a member. Mr. Adkin exhibited a varied series of *Abraxas grossulariata* and contributed notes. Mr. Ashly, a long and varied series of the Coleopteron, *Onthophagus vacca*, from Willesden. Mr. F. M. B. Carr, series of *Taniocampa gothica* taken at sallow in the New Forest, at Easter, in 1899 and 1900; and a pair of *Trichiura eratagi*, bred from larvæ taken at Hailsham. Mr. Turner, a number of species of Lepidoptera and a few specimens of other orders, from Dawlish, and read notes on the fauna of that place, entitled, "Desultory Days at Dawlish in August, 1900."

December 13th.—The President in the chair. Mr. Nottle, of Lower Sydenham, and Mr. R. L. Hewitt, of Lewisham, were elected members. Mr. Turner, on behalf of Mr. Tunaley, exhibited a specimen of *Spilodes paleatis* taken in the Isle of Wight in July, with five specimens of *Acherontia atropos* bred from larvæ taken at Porlock, North Devon. Mr. R. Adkin, living examples of *Caradrina ambigua*, bred on Dec. 12th from South Devon ova, and presented them to the Society's collection. Mr. Clarke, a specimen of *Locusta viridissima* from Deal, and presented it to the Society's collection. Mr. Turner, large and well-bred examples of *Ocneria dispar*. Mr. Sich, an example of *Oporabia autumnata*, bred November 7th, from a larvæ taken on elm in Sussex. Mr. Manger, a number of species of Rhopalocera taken in and around Ladysmith, Natal, including *Pieris hellica*, *Colias electra*, *C. hyale*, *Pyrameis cardui*, *Precis sesamus*, *Teracolli johnstoni*, &c. Mr. MacArthur, a large number of *Arctia caia*, including one with very pale wings. Mr. Tutt, specimens of an Alpine form of *Polygonmatius dorilis*, and made remarks on the double-broodedness of the species. Mr. Kemp, a Psocid *Clothilla studiosa*. Mr. Moore, a specimen of *Ophion luteum*, and said that he frequently took this species of Ichneumon in October and November. Dr. Chapman, a number of specimens prepared to show the various points in his paper. "Some Wing-structures in Lepidoptera."

January 10th, 1901.—The President in the chair. Mr. R. Adkin exhibited a specimen of *Hepialus sylvanus*, which he took on the downs near Birling Gap, Sussex, September 4th, while drying its wings on a plant of viper's bugloss (*Echium vulgare*), together with the pupa skin, which he found protruding from the root of the same plant. Dr. Chapman exhibited a nice series of *Argynnis thore*, an Alpine species from Pontresina, 6,000 feet. Mr. H. J. Turner, specimens of *Locusta viridissima* from Ventnor, where it was common in 1899, and a specimen of the milk thistle, *Carduus* (*Silybum*) *marianum*, found on the downs near Swanage. Mr. Montgomery, long bred series of *Colias edusa* and var. *helice*, with intermediate forms and contributed notes. Mr. Lucas, specimens of the land shell, *Clausilia laminata* and var. *albinos*. Mr. F. Noad Clarke, with the lantern, a large number of Photomicrographs of Lepidopterous ova, and contributed notes. The whole of the photographs were very skilfully produced, and were all to one scale of size.—H. J. TURNER, Hon. Rep. Sec.

RECENT LITERATURE.

JOHN B. SMITH. *Insects of New Jersey*. Suppt. 27 Ann. Rep. State Board of Agriculture for New Jersey for 1899 (1900, 755 pp. and 2 maps; 328 figs.).

This comprehensive catalogue is an extension of a similar list prepared some ten years ago. After introductory chapters on the development of insects, the injury caused by them, insecticides, machinery, &c., a complete list, so far as is known, is given of all the insect orders, twenty-two of these being recognized. Brief diagnoses of the families are followed by an enumeration (after each family) of the species, with localities. Three hundred and twenty-eight figures of the more noteworthy insects are inserted, either in the text or in full-page plates; most of these are from well-known sources, such as Dr. Smith's own 'Experiment Station Reports,' Riley's Missouri Reports, and those of the United States Department of Agriculture. The second map (of New Jersey, showing the location of the San José Scale Colonies) is by mistake numbered fig. 392 instead of 329.

A very useful feature, for local workers, is the "Index to Localities" (pp. 703-20), stating the best-known centres for collecting, and their characteristics. The total number of New Jersey Insecta is 8537 species, an increase of 2439 since the first edition, ten years ago: Coleoptera, with 2845; Lepidoptera, with 1570; Diptera, with 1193; and Hymenoptera, with 1718, have been the most fully worked orders.

G. W. K.

E. A. ORMEROD. *Flies Injurious to Stock* (London, 1900, 80 pp. 24 figs.).

This little work is professedly a compilation, to a large extent from the authoress's previous writings, for the use of those interested or engaged in farm-work. At the same time it contains a large amount of information anent the habits of the various British Diptera implicated, particularly *Estrus ovis* (by misprint in list of subjects "*ovinus*") and *Melophagus ovinus* on sheep; *Gastrophilus equi*, *Hippobosca equina*, seven *Tabanidæ* and *Hypoderma* sp. on horse; and *Hypoderma bovis* on ox. The work ought to be in every British entomologist's library, and it is for this reason, and on account of the nominal price, that a longer notice is not given. The only fault of the book is the length of the extracts from correspondence, which could probably have been much abbreviated, and the gist of the matter more ably submitted to the reader in the authoress's own words.

G. W. K.

Coleoptera.—R. SCHOLZ records (1900, Illus. Geit. für Entom. 298), a beetle, *Stenocorus fasciatus*, Fabr., with monstrous abdomen. The first ventral segment is, according to the author, twisted out of its place; the second segment is smashed, part (on the left side) being anterior to the first, part (on the right side) being posterior to the first. G. DE ROSSI records (*l. c.*, 313) an example of *Geotrypes spiniger*,

Marsh., of which the left elytron is entirely red; a male example of *Ptinus brunneus*, Dft., with a round vesicle (*Blase*) on each elytron; one of *Melasoma cupreum*, Fb., which has only the rudiment of an anterior tarsus with the claw-segment; *Adalia bipunctata*, L., with the left elytron var. *herbsti*, the right var. *pruni*. In nine hundred examples of *Leptinotarsa 10-lineata*, Say, only three were abnormal.

J. JÓZSA notes (1900, 'Rovartani Lapok,' p. 152, with 2 figures and résumé 14) a monstrosity of *Carabus hampei*, Kust., collected at Deés. The left posterior femur is very strongly thickened and divided into two parts close to the apex; from each of these parts arises a normal tibia; on the upper tibia are arranged in a row the normal five tarsal segments; on the under tibia there are only two tarsal segments, the second of which is somewhat flat and pointed at the apex.

Diptera.—J. J. KIEFFER discusses the Claws and Arolia in the Diptera (1900, "Ueber die Krallen und die Haftläppchen der Dipteren," in *Illustr. Zeitschr. für Entom.*, v. pp. 337-40. Plate).

L. WEBER notices the Diptera parasitic, &c., on Man and the other "higher Mammalia") *Abh. Ber. Ver. Naturk. Cassel.*, xlv. pp. 1-20 [? sep.].

Hymenoptera.—W. POSPJELOW contributes an article on the parasites of the Hessian Fly (*Cecidomyia destructor*) in Russia (1900, *Illustr. Zeitschr. für Entom.*, 261-4; 6 figs.).

Rhynchota.—W. W. FROGGATT monographs the Australian Psyllidæ (1900, *Proc. Linn. Soc. New South Wales*, 250-302; plates xi.-xiv.); 10 genera (8 new) and 25 species (18 new) are described.

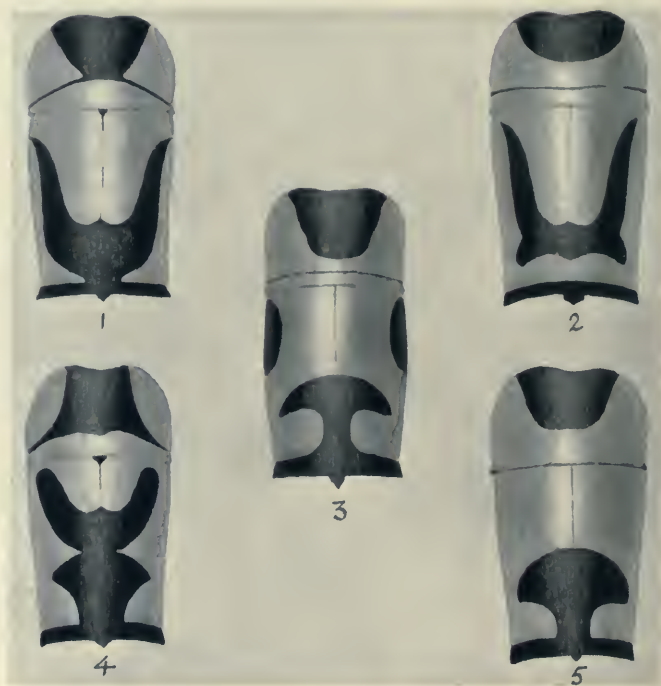
Economic Entomology.—W. W. Froggatt has lately published (1900) a number of small pamphlets on Australian Insects, in the "Miscellaneous Publications" of the Department of Agriculture of New South Wales, viz. :—

- (a) "Notes on Australian Coccidæ," no. 358, 9 pp., 1 plate.
- (β) "Plague Locusts," no. 363, 9 pp., 1 plate.
- (γ) "The Hessian Fly (*Cecidomyia destructor*, Say) and allied Grain Pests," no. 369, 6 pp., 1 plate.
- (δ) "Insects living in Figs, with some account of Caprification," no. 388, 10 pp., 1 plate.
- (ε) "Insects and Birds," no. 387; 11 pp.

Also a pamphlet—which appears from negative evidence to be a separate publication—on "Scale Insects that produce Lac"; 5 pp. and 1 plate.

Fossil Entomology.—HERBERT GOSS. "The Geological Antiquity of Insects." 2nd edition (Gurney & Jackson); 52 pp. Practically a reprint of the useful first edition published twenty years ago, with a preface embodying the more recent discoveries of Palæozoic Insects. Unfortunately the author has been unable to discuss the vast mass of information anent fossil Kainozoic insects published within the last decade by Scudder and others.

G. W. K.



W. J. Lucas, del.

West, Newman, photo-typ.

First and Second Segments of:—1. *Agrion pulchellum* ♂ ; 2. *A. puella* ♂ ;
3. *A. hastulatum* ♂ ; 4. *A. mercuriale* ♂ ; 5. *Enallagma cyathigerum* ♂ .

All much magnified.

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[No. 454.]

ODONATA IN 1900.

By W. J. LUCAS, B.A., F.E.S.

PLATES I. AND II.

THOUGH perhaps somewhat earlier than in 1899, yet the spring dragonflies were rather slow to assume the imaginal condition. Specimens of what were probably *Libellula quadrimaculata* were certainly noticed as early as April 22nd—one in Epping Forest (A. Harrison), and another at Merton, in Surrey (J. S. Brocklesby); one or two *Pyrrhosoma nymphula* were found on Esher Common on May 5th, and at the same place, on May 13th, a male of *Enallagma cyathigerum*, and another of *Cordulia ænea*, both but just emerged; a specimen of *Libellula depressa* was secured in the New Forest on May 16th (W. J. Cross), and *Ischnura elegans* (S. W. Kemp) was taken at Acton the next day. But still it was not till the very end of May that the earlier species began to appear at all commonly, and even at the beginning of June many of them were still in a very teneral condition as regards colouring. Passing to the end of the season, *Pyrrhosoma tenellum*, which was first seen in the New Forest at the very beginning of June, was last taken on September 16th; *E. cyathigerum* (first seen May 13th) lasted a little longer, till September 22nd. *Aeschna mixta* was about in some numbers on Esher Common till October 7th at least. *Sympetrum scoticum* and *S. striolatum* were seen on Esher Common on October 28th, and the last no doubt might have been found in decreasing numbers for about three weeks longer, till the middle of November, after which date I have never seen it.

No specimen of *Sympetrum vulgatum* seems to have been detected during 1900, but I have to record a male which I possess myself. It is labelled "Richmond Park, September 11th," and

was taken in 1898, but was put away unset, not being distinguished at the time from *S. striolatum*, which it so closely resembles. Males of *Sympetrum flavicolum* were again present on Ockham Common, and Major Robertson secured a male at Denny Bog, in the New Forest. No females were again detected. Should we still consider their presence due to an immigration? Dr. F. A. Walker took both sexes in Alderney in June and July. Males and females of *Sympetrum sanguineum* were taken on Ockham Common. Could it have been overlooked when for several seasons, a few years since, Mr. C. A. Briggs worked the locality so carefully? The species was received from Horsmonden, in Kent (R. South).

About *Libellula quadrimaculata* the most interesting point is a large migration noticed in the west of Europe in June. By some continental observers it was thought to have come from England. The reverse, however, was the case. At Margate, on June 10th, Mr. H. Stocks observed an immigration of what by description must have been dragonflies of this species. The same flight was also observed by Mr. A. J. Mann between Margate and Broadstairs the same day: Mr. Mann took three specimens. On June 19th Mr. G. Bolam, of Berwick, wrote to the Editor of the 'Entomologist,' saying that he had seen an immigration, presumably on July 17th: that it was of *L. quadrimaculata* was proved by the specimen forwarded for identification. Part of the migration appears to have reached Huddersfield (*vide* Entom. xxxiii. pp. 210, 247, 248). *Libellula fulva* does not seem to have been noticed during the season.

Orthetrum cærulescens was again very common in the New Forest. It was just coming on the wing during the first days of June, when one was taken (F. M. B. Carr) with lateral dark bands on the abdomen, somewhat like those in its British congener. A nymph-skin was obtained on June 5th in the company of a newly-emerged imago, and another as late as the end of July. They somewhat resemble *Sympetrum scoticum* in general appearance, but are darker and slightly incrustated with mud. Apparently they are bred in the very wet boggy ground rather than in the pools or streams. A new Surrey locality is Chobham Common (E. Vincent). A female of *Orthetrum cancellatum* was taken by Mr. D. Kirkaldy at the Broads—an interesting capture, as there have been no records of late years except from the South of England.

A specimen of *Gomphus vulgatissimus* was taken at Walton-on-Thames (A. B. Higgs), and Mr. McLachlan tells me he took several at Weybridge in 1871; many nymph-skins were also taken at Eynsham, in Berkshire (A. East). These points strengthen the position of *G. vulgatissimus* as a Thames insect. Two captures in the middle of last century (19th) have been made known for Sussex.

On June 17th a fine female *Cordulegaster annulatus* was taken on Esher Common, Surrey. It was at rest on the vegetation by the margin of the pond, and when captured did not attempt to fly. It died in the box on the way home, and when captured was, no doubt, in a moribund condition. What was its origin? But one locality in the county—Ottershaw, near Chertsey—had previously been recorded for the species. On June 3rd a male was taken in the New Forest (F. M. B. Carr) by the side of the nymph-case, from which it had recently emerged. The latter was of a peculiar appearance—broad head and tiny prominent eyes, sturdy form, and sharply tapering abdomen, hairy at the sutures. The nymph apparently lives in the mud, for the dingy skin of this specimen was somewhat encrusted with it. L. Cabot's figure of the slightly immature nymph in his "Immature State of the Odonata" gives a good idea of the full-grown form.

Anax imperator was bred on June 13th. A nymph had crawled up out of the water about 10 o'clock the previous evening, but had fallen back again into the water. In all probability it must have crawled up again very quickly, for it had emerged (a male), and was full-grown with wings expanded by 6 o'clock the next morning. By 6.30 it had flown off from its support. As regards immature colouring, head, eyes, thorax, and abdomen were in general yellowish green, but there was a slightly bluish tinge on parts of the abdomen. The costal margin of the wings and the pterostigma were pale yellow. The divisions between the segments of the abdomen were yellowish, and they were of the same colour when, a day or two later, the insect was killed. The segments themselves were then of a strange lavender-green tint. The species was as usual pretty plentiful on Esher Common, but very difficult to catch.

On June 6th *Brachytron pratense* was taken (F. M. B. Carr) at Hatchet Pond, in the New Forest. A nymph which was bred early in June remained some days with its head above water before disclosing the imago.

One of the most striking features of the season was the comparative abundance of the usually scarce dragonfly *Æschna mixta*; but so wary an insect is it, that the captures in all probability have not been really numerous. A considerable number of localities have, however, been added to the half dozen or so previously known. These are—*Surrey*: near Elstead (W. J. L.); *Sussex*: Worthing (F. Summerson); Camber Sands (? whether 1900. E. Connold); *Kent*: Shoreham (A. Buckstone); Kingsgate (H. Sauzé), Ramsgate and Hythe (C. Colthrup), Folkestone (S. Hills); *Hants*: New Forest (W. J. L.); *Dorset*: Abbotsbury (W. J. L.); *Essex*: Pitsea (H. J. Turner), Loughton (F. M. B. Carr); *Norfolk*: Cromer (S. Blenkarn), Mundesley-on-Sea (S. Kemp). On Esher Common the species was very plentiful. There may have been an immigration, but if so females came

also ; it is, however, more probably an instance of the periodical abundance of an insect without any clear reason, for early specimens were immature, and it would seem therefore must have been bred here. Has the succession of warm summers anything to do with the increase in numbers ? Rev. A. East's most interesting observations and experiments in connection with *Aeschna cyanea* have been recorded in this magazine, and it will therefore only be necessary now to give the references to them (Entom. xxxiii. pp. 88, 211, 257 ; *vide* also xxxiii. p. 350, and xxxiv. p. 53). *Aeschna isosceles* still awaits a rediscoverer.

Although the Channel Islands are not geographically in the British Islands, it may be well to note that Dr. F. A. Walker took *Lestes barbara* commonly in Alderney.

At the canal between Byfleet and Weybridge a few imagines of *Platynemis pennipes* were found by Mr. H. Stocks and myself, and I again bred the species from a New Forest nymph. Mr. East also took the imago by the Thames near Bablockhythe. *Erythromma najas* was bred by Mr. F. Enock from nymphs taken at Loughton.

In the New Forest last season I captured two extreme forms of the female of *Pyrrhosoma tenellum*—one with abdomen black-bronze, the other with abdomen crimson like that of the male. For purposes of reference and description, I will call the former var. *æneatum*, and the latter var. *rubratum*. In *æneatum* (Pl. I. fig. 5) all the segments are black-bronze except narrow circlets at the sutures, which are yellow interrupted with bronze ; the ventral surface of the abdomen is yellow. Mr. A. H. Hamm took several specimens of the same form in Devonshire, at Newton Abbot and Bovey Tracey. It is probably only a coincidence that the nymph-skin of a specimen bred of this variety was perceptibly darker than the skin of a nymph which produced a normal female. Mr. J. C. Dale took this variety in Dorset (De Selys, 'Revue,' p. 181). A year or two since I took in the New Forest an intermediate form. In *rubratum* (Pl. I. fig. 4) all the segments are crimson, but there are narrow black circlets between segments 2-7 at least ; the dorsal surface of the thorax is entirely black-bronze, the face also is as in the male. I have so far met with only two or three specimens, all in the New Forest. De Selys describes this variety ('Revue,' p. 181), and refers to an intermediate form. Before leaving this species I might say that the nymph closely resembles that of *P. nymphula* in miniature. During an emergence observed on June 23rd the "rest" which lasted eleven minutes was taken with the head and thorax upright.

Pyrrhosoma nymphula has also a var. *æneatum* (Pl. I. fig. 3). The dorsal surface of all the segments is practically black-bronze, except the circlet, which is yellow, interrupted mid-dorsally with black-bronze ; the sides are yellow, and so are the markings on

head and thorax. They were taken by Mr. F. M. B. Carr and myself in the New Forest early in the season; perhaps later on the yellow might have changed to crimson; in fact, in one specimen at least it seemed to be doing so, especially towards the apex of the abdomen. De Selys, however ('Revue,' p. 179), in speaking of the same variety, describes the not-black parts as yellow.

Early last year Mr. S. A. Blenkarn brought for my inspection several dragonflies which he had taken during the previous season. Amongst them were two or three specimens of the long-lost *Ischnura pumilio*. Strange to say, in the beginning of June last year, Messrs. Carr and myself found the species in a very restricted locality in the New Forest, and between us, after diligent search on three or four days, secured eleven specimens, two only being females and both belonging to var. *aurantiaca*. It is still more strange that Mr. Blenkarn, while collecting in Abbot's Wood in July last, should capture two more examples of the same species. Mr. Blenkarn gave me two of his specimens, and some of the remainder are in the cabinet of Mr. G. T. Porritt. The most striking point of distinction between males of *I. pumilio* and its congener *Ischnura elegans* lies in the position of the blue spot near the apex of the abdomen. This will be seen better from Pl. I. figs. 1, 2, than from a lengthened description. It should be recollected that in the female of *I. elegans* the blue spot is present, from that sex of *I. pumilio* it is absent. I visited the locality in the New Forest again at the end of July, but *pumilio* was over.

Perhaps more satisfactory than the capture of *I. pumilio* is the discovery in Scotland of a species new to the British list. Amongst some dragonflies captured in Strathglass by Colonel Yerbury was a single male of *Agrion hastulatum*. In the usual way the male of this species is easily distinguished from *Enallagma cyathigerum*, which in general appearance it closely resembles, by the spots on the dorsal surface of the second segment (see Pl. II. figs. 3 and 5). The two lateral spots are, however, sometimes absent, as is the case in the Scotch example, and the remaining spot resembles the corresponding spot on some forms of *E. cyathigerum*. However, on consideration of other less conspicuous points of difference, the Scotch insect has been found to be a true *Agrion hastulatum*, and we hope soon to find the number of captures increased, when amongst them will no doubt be found examples of the typical form.

It should be stated that many new localities for the common species have been found during the year; but the list is too lengthy for insertion here.

NEUROPTERA, OTHER THAN ODONATA, IN 1900.

By W. J. LUCAS, B.A., F.E.S.

So few localities for many of the Neuroptera have been recorded that perhaps a list of my captures in 1900, even of common species, may be of interest. They were not collected systematically.

PSOCIDÆ.—*Stenopsocus cruciatus*, New Forest, August 13th; *Elipsocus unipunctatus*, Esher Common, July 1st; *E. abieti*; New Forest, August 13th.

PERLIDÆ.—*Chloroperla grammatica*, New Forest, beginning of June; *Isopteryx torrentium*, New Forest, beginning of June; *Leuctra* (*nigra* probably), Esher Common, May 19th; *Nemoura inconspicua*, Esher Common, May 19th and September 10th; *N. variegata*, Esher Common, May 19th.

EPHEMERIDÆ.—*Ephemera vulgata*, Byfleet Canal, Surrey, July 8th; *Leptophlebia submarginata*, Esher Common, May 19th; New Forest, beginning of June; *Cloeon simile*, Ockham Common, June 23rd; *C. rufulum*, New Forest, July 28th.

PLANIPENNIA.—*Sialis lutaria*, Esher Common, May 19th and June 17th; New Forest, beginning of June; *Raphidia notata*, Esher Common, July 14th; *R. maculicollis*, Esher Common, May 19th and June 10th; *Osmylus maculatus*, New Forest, June 4th; *Hemerobius nitidulus*, Esher Common, April 24th, May 19th; *H. micans*, near Horsley, Surrey, May 30th; New Forest, August 13th; *H. stigma*, Esher Common, January 6th, February 25th, March 10th, April 24th, May 19th, June 17th, September 1st, December 16th; *H. concinnus*, very numerous, Ockham Common, Surrey, June 23rd; *Chrysopa flavifrons*, at sugar, New Forest, August 11th; *C. tenella* (probably), Esher Common, June 10th; *C. vulgaris*, New Forest, August 7th; near Studland, August 8th; *C. phyllochroma*, New Forest, July 31st; *C. perla*, Esher Common, June 10th and 17th; *Coniopteryx aleyrodiformis*, Esher Common, May 19th; *Panorpa communis*, New Forest, beginning of June; *P. germanica*, Bagley Wood, Berks, August 29th; near Claygate, Surrey, September 10th.

TRICHOPTERA.—*Phryganea varia*, Esher Common, June 30th; *Glyptotaelius pellucidus*, Esher Common, May 19th; near Chertsey, Surrey, July; *Limnophilus affinis*, near Studland, Dorset, August 8th; *L. centralis*, Esher Common, May 19th; near Esher, June 30th; *Micropterna sequax*, near Horsley, Surrey, July 7th; *Sericostoma personatum*, New Forest, beginning of June; *Goëra pilosa*, New Forest, beginning of June; *Leptocerus cinereus*, Weybridge, Surrey, June 24th, July 8th; *L. alboguttatus*, Kingston-on-Thames, June; *Holocentropus picicornis*, near Ockham, Surrey, June 23rd; *Cyrnus trimaculatus*, Weybridge, June 24th.

THE NAVAL MANŒUVRES OF 1900, FROM AN ENTOMOLOGIST'S POINT OF VIEW.

By T. B. FLETCHER, R.N., F.E.S.

THOUGH the connection between the naval manœuvres and a scientific magazine may at first sight appear rather distant, I have thought that a few entomological extracts from my log for the period may prove of interest.

We commissioned H.M.S. 'Edinburgh' at Chatham on July 10th, and left Sheerness on the 12th for Portland, which was the rendezvous of the "A" Fleet. It was much too busy a time just now to do any collecting, though visions of Portland's far-famed products in the way of *Acidalia degeneraria* and *Agrotis præcox*, with *Thymelicus actæon* quite in the neighbourhood, seemed to offer temptation enough. All the ships having joined the flag, we left again on July 16th for Berehaven, where, however, our stay proved to be only for five hours, as we were hurried on to Lough Swilly.

Here we had a day or two before hostilities commenced, so I managed to get ashore on July 21st. There were, however, not many butterflies about, though it was a bright afternoon and hot enough climbing the hills in the sun. *Epinephela ianira* was the commonest species on the wing; the markings on the under side of the hind wings seem more pronounced than usual. *Satyrus semele*, two only, apparently just emerging. *Lycæna icarus*, common in cornfields. *Pieris napi*, one only. *P. brassicæ*, common. When I left England in 1896 I had not seen one for two or three years. I think it was in 1894 that they seemed suddenly to disappear, but now they have apparently become as common as ever. *Camptogramma bilineata*, one, beaten. The absence of moths seems remarkable.

On July 26th we left Lough Swilly to make a long detour into the Atlantic and up the Channel to Queenstown, and by the time we got there hostilities had ceased. After another stay of a few days at Portland we returned to Sheerness to pay off, and now there was more leisure for collecting.

On August 11th I took the net out along the clay cliffs of Sheppey—well-known to fossil-hunters. In the Dockyard, on the way, I saw a few worn *Stilpnotia salicis* on the poplars, and a *Macroglossa stellatarum* buzzing around a coal-heap, an object which seems to exercise a great fascination for this species. Arrived at the cliffs, the lucerne fields were found to be the great attraction, being simply alive with insect life. *Colias edusa* was represented by a few specimens, but *C. hyale* was simply in scores. This latter is more easily captured than *edusa*, but must be caught at the first stroke of the net, for, once alarmed, pursuit through the heavy lucerne is almost useless. *Gonepteryx rhamni*,

one male, quite fresh. *Pieris brassicæ* and *P. rapæ*, abundant. *P. napi*, one female only. *Aglaïs (Vanessa) urticæ*, very common. *Vanessa polychloros*, *V. io*, and *Pyrameis atalanta*, single specimens of each. *P. cardui*, common. *Pararge megæra*, a few of the second brood; just emerging. *Epinephele ianira* and *E. tithonus*, abundant, but worn and tattered. *Lycæna astrarche*, one. *L. icarus*, several on grassy patches, but none on the lucerne. *Hesperia thaumas (linea)*, a few, very worn, along the cliffs. I netted all I saw in hopes of *lineola*, which occurs here, but they were all *thaumas*. *Anthrocera filipendulæ*, one colony, about half-way down the cliffs. *Spilarctia menthastri*, one larva. *Bryophila perla*, one, on a gate-post in the town. *Eremobia ochroleuca*, two, both at rest on flower-heads. *Hadena trifolii*, one, flying round the lucerne in the sunshine. *Plusia gamma*, absolutely in thousands round the lucerne. *Strenia clathrata*, a few along the cliffs. *Eubolia limitata*, common amongst mallow. *E. bipunctaria*, one only.

On August 14th I went out along the cliffs again. It was beautifully bright and hot, but a strong easterly breeze, which got up in the afternoon, could well have been dispensed with from a collecting point of view. *Colias hyale* and *C. edusa* were again abundant in the lucerne fields, the latter being now more plentiful. Of *C. hyale* I took a very nice white female. *Pieris brassicæ* and *P. rapæ*, common; full-fed larvæ and pupæ of *P. rapæ*. *Aglaïs urticæ*, a few; several chrysalids near nettles. *Pyrameis cardui*, common. *P. atalanta*, several full-fed larvæ on nettle. The larva spins a leaf together lengthwise and pupates inside it. *E. ianira* and *tithonus*, common, but very worn. *L. icarus*, common; one "dwarf" specimen. *Chrysophanus phlæas*, one only. *M. stellatarum*, one, on lucerne. *Porthesia similis (auriflua)*, several settled on leaves at the bottoms of hedges. *Plusia gamma*, abundant on the lucerne. *Strenia clathrata*, common. *Hepialus sylvanus*, one, on a post in the Dockyard.

On August 16th I landed again with the net. It was beautifully fine and bright, but there was a north-easterly breeze, which was much too strong for the butterflies, and few were about except in sheltered corners. *Colias hyale* and *edusa*, abundant in the lucerne fields. *Aglaïs urticæ*, only one butterfly, but quantities of larvæ of all ages. *Vanessa polychloros*, one at rest under a hedge. *Pararge megæra*, common along the sunny sides of hedges, out of the wind. *E. ianira* and *tithonus*, common along hedges, but very worn. *Cænonympha pamphilus*, common. *Chrysophanus phlæas*, one, very worn. *Cyaniris (Lycæna) argiolus*, one worn male along a hedge. *L. icarus*, common. *L. astrarche*, one. *Smerinthus ocellatus*, a fine larva on willow. *Plusia gamma*, not nearly as plentiful as previously. It seems as if they had dispersed or migrated. The difference in numbers was to-day

most striking. Two days ago there were thousands on the wing round the lucerne flowers; to-day a few solitary specimens were all that remained.

This concludes my collecting during the manœuvres. Except for the last week at Sheerness, which yielded twenty species of butterflies, there were few opportunities of collecting, if we omit *Tinea biseliella*, which was only too abundant on board! It is evident that 1900 will long be remembered as "the great *Colias* year," but I do not recollect having seen in the magazines any previous record of either species from Sheppey.

H.M.S. 'Gladiator,' Mediterranean Station.

ON THE FEMALE POUCH IN *ACRÆA*.

BY GUY A. K. MARSHALL, F.Z.S., F.E.S.

IN the November issue of the 'Entomologist' Dr. Chapman raises an interesting question as to the significance of the curious anal pouch which is found in the females of *Parnassius*. It may therefore be as well to record the fact that a similar structure occurs in the females of *Acræa*, these being, I believe, the only two genera of butterflies which exhibit this peculiarity, and it seems at least probable that it may serve the same purpose in both cases.

A year or two ago, when writing to me on this subject, Professor Poulton suggested that possibly the structure might be of use in guiding the egg during oviposition, or even that the egg might be carried in it until a suitable place for it had been found. Therefore, in order to obtain some evidence for the former proposition, I carefully watched several examples of *Acræa caldarena* and *A. nohara-halali* during the act of laying their eggs. As a result of this I found that the egg, on extrusion, did not in any way come into contact with the pouch, this latter being placed too much upon the ventral surface of the abdomen to render it of any use for the purpose of oviposition. Indeed, in some cases it appeared to be rather an obstruction than otherwise, for in the food-plant of these *Acrææ* the sides of the leaves sometimes fold together rather closely, and more than once I have seen a female trying to insert her abdomen in such a place, but prevented from doing so by the projecting pouch.

Again, both the position and construction of the pouch render it highly improbable that it can be used for the purpose of transporting the eggs, and although I have caught some hundreds of the insects at various times, I have never yet found this to be the case.

Further, so far as the genus *Acræa* is concerned, the structure cannot be used for jerking the eggs away, as suggested by Dr. Chapman for *Parnassius*, for, as stated above, the eggs do not touch it; and, besides, in the six species of *Acræa* which I have seen laying their eggs, these were always deposited on the plant, and not jerked away.

I am thus inclined to believe that in *Acræa* the sac has no connection with oviposition, but that its use consists in protecting the gravid females from the advances of unattached males. But the question then arises, why the female *Acræa* should require this special protection. In reply thereto I may say that, so far as my observation goes, in all our South African butterflies, "marriage by courtship" is the rule, with the exception of the *Acræas*, among which "marriage by capture" is certainly a frequent, and probably the general, method; at least, I have observed its occurrence in no less than eight different species of the genus. The male *Acræa* does not indulge in the graceful fluttering and "showing-off" which is so characteristic of the courtship of most butterflies, but his chief idea seems to be to seize the female with his legs. In the case of the sylvan *A. petræa* and *A. horta* I have frequently seen a male capture a female in mid-air by grappling the costa of her fore wing, thus bearing her to the ground, when, after a few seconds, they would fly away paired. In the open veldt species, as *doubledayi*, *nohara*, *violarum*, &c., the female is more often pounced upon while settled on the ground.

The importance of some protection for the female while laying her eggs under these circumstances is sufficiently evident, and the development of the pouch has therefore been probably fostered by natural selection. However, there is evidence to show that the protection afforded by the secretion of this process is not absolute, for I have taken three females in which the sac has been duplicated, which I can only attribute to the result of a second pairing. In every case both sacs were more or less distorted or abnormal in shape, and it is therefore probable that the second pairing must have taken place almost immediately after the first, that is, whilst the first pouch was still soft or pliable. If this be so, these exceptions need not invalidate the supposition that the pouch, when hardened, would offer a sufficient obstruction to the use of the complicated male claspers. It may be mentioned, that after a certain time the sac is more easily detached from the ventral plate, and it is thus frequently wanting in old and battered specimens.

In those butterflies in which courtship precedes pairing the male soon ceases his attentions after persistent refusal; but among many of the Pieridæ a characteristic attitude is adopted by the female for this purpose. The wings are laid flat on the ground, but directed so much backwards that the fore wing

almost entirely conceals the hind wing, and the abdomen is raised high in the air. As pairing generally takes place from the side in these butterflies, such a position effectually prevents it; and from the numerous cases which have come under my notice, I can have but little doubt that the significance of the attitude is appreciated by the male.

It will be of much interest to learn whether there is any reason to believe that the mating habits of *Parnassius* are similar to those of *Acræa*; for, if it be so, it will lend considerable support to the explanation of the pouch proposed above.

Salisbury, Mashonaland : December, 1900.

SYNOPSIS OF EXPERIMENTS IN HYBRIDIZATION AND TEMPERATURE MADE WITH LEPIDOPTERA UP TO THE END OF 1898.

By PROF. DR. MAX STANDFUSS.

(Concluded from p. 13.)

THESE peculiar phenomena will be more easily understood by two observations made by Darwin, who gathered a lot of interesting material about these matters in his wonderful works.

Firstly, he cites a number of facts, which apparently prove the presence of characters which are present in a latent form in the living creature, and, under normal conditions, remain latent. He states, that there exist in all females secondary male characters in a latent form, and, *vice versâ*, which are in a state of quiescence, but are ready, under certain conditions, to develope.

Secondly, Darwin proves the existence of a correlative change, in fact, the correlation of parts of the living organism. A special case of correlation of characters is that between primary and secondary sexual characters. Stags, whose testicles have been injured either by a shot or in any other manner, grow monstrous horns. If one testicle is entirely lost, the horn on that side of the body ceases entirely to develope.

It is, further, by no means rare for female individuals, whose genital apparatus has been injured, removed by an operation, or become atrophied by age, to acquire secondary male sexual characters; as, on the other hand, the male may acquire secondary female sexual characters. These facts are to be traced to the presence, in a latent form, of the characters of the other sex.

In our special case of gynandromorphic structures among secondary hybrids, the malformation and degeneration of the egg-

germs of these forms are to be traced,¹¹ chiefly, to the evil influence on the sexual products exercised by the primary hybrid parents; and, secondly, in a lesser degree, to their own hybrid origin.

The appearance of a male-female form—that is, in outward appearance—is, therefore, directly connected with this degeneration and malformation of the egg-germs. It would be of great interest to ascertain the condition of the genital products of female hybrids capable of reproduction. The hybridization experiments, recently tried with other Bombycid species, whose female hybrids produce numerous and, to outward appearance, normal eggs, can be used for such a study.

It may here be observed, that the close correlation, which undoubtedly exists between the structures situated in the centre of an organism, the germ products, and the secondary sexual characters situated on the outer periphery of the body—centrifugal relationships, as we may call them—make probable the existence, on the other hand, of close correlation in a reversed or centripetal direction; that is to say, changes which appear in the periphery, also those which owe their appearance to factors of the outer world, cause changes in the central organs, that is, the egg-germs and their products. An influence in a centripetal direction actually occurred in the first experiments with regard to the altered markings of *Vanessa urticae*, as the latter were actually transmitted to the offspring. The warmth experiments with the pupæ of *Rhodocera rhamni* exhibit a singular example of the resulting centrifugal influence.

A number of females obtained by this experiment had almost entirely taken over the male coloration. Those female individuals which were experimented with, while throwing off the larval skin or as fresh pupæ, were especially influenced in the direction of male coloration. But these latter also showed a distinct crippling of the egg-germs, which could generally be observed from the outside, by a noticeable shrinkage of the whole abdomen of freshly-emerged specimens. As a result of the latest experiments may be mentioned, that the females of *Saturnia cæcigena*, Cup., obtained feathered antennæ, which otherwise are confined to the male.

These females were obtained from pupæ, which were experimentally compelled to hibernate, and these insects also showed a decided and anatomically easily proved crippling of the egg-masses. The experimental influence on the egg-germs is in both cases bilaterally symmetrical, and following the correlative alteration in the periphery of the body in an entirely systematic manner, even when the change is only partial. These are, then,

¹¹ Compare O. Hertwig ('Zeit und Streitfragen der Biologie.' Jena: G. Fischer, 1894, pp. 120, 121).

phenomena closely related to gynandromorphism. On the other hand, it is obvious that the individuals are not hermaphrodites. The females remain females, only their fertility has suffered by the experiment, or has been destroyed by the same.

At this opportunity it would be well to mention, that female germs seem to be much more sensible to influences than the male.

Firstly, all were females in the above-mentioned temperature experiments, at least as far as our present experience goes.

Secondly, the gynandromorphic individuals of the secondary hybrids are predominantly female in their character.

Thirdly, the fact that the female hybrids, with rare exceptions, are not capable of reproduction, whereas the male hybrids are always fertile.

Fourthly, must here be mentioned the inclination of female individuals to sterility when badly fed, if this want of food is caused by man (I have mentioned such instances in my book 'Palaäarktische Gross-Schmetterlinge,' pp. 194, 195), or from the habits of certain social insects—for instance, Hymenoptera (ants and bees) and Termites. Prof. Emery (Bologna) has published many facts about this alimentary castration, as he calls it, of ants ('Compte-rendu des séances du troisième congrès international de Zoologie,' Sept. 16th to 21st, 1895: Leyde, pp. 395-410).

But now to return to the continuation of the hybridization experiments in 1897. Among the primary hybrids obtained in the first crossings between the *Saturnias spini*, *pyri*, and *pavonia*, neither in my own experiments nor in those made by others was a single primary hybrid obtained which was capable of reproduction, even in the slightest degree, when crossed with one another, only one secondary hybrid, No. 18, was fertile to a slight degree.

Moreover, no other primary hybrid bred by me had the necessary qualifications, with the exception of the crossing between *Zygæna trifolii* ♂ and *Z. filipendulæ* ♀; and that crossing was, at that period, unfortunately not investigated with regard to this question; nor has such a capability of reproduction been noticed in any of the other Lepidopterous hybrids which have been reared up to the present.

It was not to be expected, according to present experience, that this blank in the experiments could be filled by related species which exhibited marked differences in physiognomical aspect; and, on the other hand, nearly related types, with habitats either entirely or nearly entirely separated, could not be used for the experiment. In the latter case, there was always the possibility that these were only local races of the same species. It is well known that local races of the same species often exhibit highly important physiognomical differences.

Moreover, forms had to be selected which, although nearly related, were, however, undoubtedly specifically distinct, but with common habitat.

The *Drepana* species, *falcataria*, L., and *curvatula*, Bkh., and the various species of the genus *Pygæra*—*pigra*, Hfn., *curtula*, L., and *anachoreta*, F.—fulfilled these conditions.

Fertile crosses between *Drepana curvatula* ♂ and *falcataria* ♀, and between *Pygæra curtula* ♂ and *pigra* ♀, and *curtula* ♂ and *anachoreta* ♀, were obtained. All these crossings were successfully reared to the imago.

The hybrid of the two hook tips (Pl. IV. figs. 5 and 6), which, in honour of my colleague, Dr. H. Rebel, of the Vienna Natural History Museum, I have named *Drep. hybr. rebeli*, mihi, paired very easily, and the females laid a varying number of eggs, which, to outward appearance, were normal.

As a matter of fact, embryos developed in a number of these eggs, but finally none of the larvæ escaped from the shells; they all died in the egg. Three eggs which were opened contained normally developed, though dead, caterpillars.¹²

The hybrid brood of *Pygæra curtula* ♂ and *pigra* ♀ produced normal male and female (Pl. IV. figs. 11 and 12). A pairing of this form, owing to the short life of the imago, would hardly have been possible, as, curiously enough, the male imagines developed much faster than the female, which is not the case to such a degree in pure species of this genus. Therefore a number of large, apparently strong males were placed in the cellar, and again brought into ordinary temperature, when the females belonging to this form commenced to emerge. In this manner five pairings of this hybrid were obtained, and the five females laid eggs in the following numbers: 85, 103, 112, 121, 154. In a fair number of these eggs larvæ developed, but the majority of these did not emerge. As a matter of fact, from the 103 developed 5; the 121, 12; and the 154, 17 larvæ.¹³ All these took readily to their food, and seemed to promise a successful development. This could, however, only be followed for a short time, as on August 22nd, 1897, I was suddenly called to North Germany on pressing duties. The larvæ had to be sleeved out on a willow tree, and there all died.

The rearing of the last hybrid to be mentioned—*P. curtula* ♂ and *P. anachoreta* ♀—produced a curious result. The greater number of the larvæ rapidly obtained their growth, and about

¹² In 1898 a small number of these caterpillars emerged from the egg, but breeding them was not successful, although the little larvæ were full of life. They took very little or no food, and all died within forty-eight hours after leaving the egg.

¹³ In 1898 I also obtained offspring from this hybrid, and again from numerous pairs, but the larvæ soon died, in spite of good weather and food; they apparently were wanting in energy.

the middle of June pupated, and during the same month produced imagines, which were one and all males (Pl. IV. fig. 14). These crossed back with *anachoreta* ♀ produced, at the beginning of August, a further imaginal generation, but again only males; all the female pupæ of this secondary hybrid hybernated. The secondary hybrid males and, as has been since found, also the females are much nearer to *P. anachoreta*, but, by exact comparison, differ in a regular manner from the last-named species, especially in the reduction of the group of dark spots at the dorsal angle of the upper side of the fore wings. The above-mentioned secondary hybrid males were again paired with *anachoreta* ♀, and produced offspring, which, however, on account of press of other work, were sleeved out, and not noted further.¹⁴

The minority of the primary hybrid larvæ of the crossing—*P. curtula* ♂ × *P. anachoreta* ♀—developed very slowly, and in a somewhat different physiognomical form to the first series; whereas the former was an intermediate form, which stood nearest to the phylogenetically oldest form, *curtula*, but which, however, had distinct traces of its *anachoreta* origin; the slow developing larvæ obtained more and more the characters of pure *curtula* larvæ. On Aug. 15th, 1897, when the offspring of nephews—obtained from the other portion of the brood, which, however, were treated in exactly the same manner—were in the larval stage, not a single one of this second series had pupated, and only two individuals were nearly full grown, which were much larger than a big, full-grown *anachoreta* larva. One of these two individuals pupated on the 21st, and the other on the 23rd of August; both were females.¹⁵ All the remaining specimens of this series would no doubt have been females, but they all died during my absence from Zurich. During this time the imagines had also emerged from the two pupæ obtained; I found them at the beginning of October still alive, but knocked to pieces; they were, as far as could be seen from their condition, mostly related in form to the phylogenetic oldest of the parent species. Both

¹⁴ In the autumn of 1898 a small number of imagines of this pairing, No. 30 (see Table, No. 15), were reared. They resulted entirely in male specimens, which differed very little from *P. anachoreta*. These males were, without doubt, capable of reproduction, although in a lesser degree.

¹⁵ Of two further female pupæ of this interesting hybrid from 1898—which I have named *P. hybr. ræschkei*, after my assistant, E. F. Ræschke, who has rendered me great assistance in my experimental entomological work during the last few years—one imago emerged in October, and the other died during the winter. The imago bred in October, 1898, is illustrated (Pl. IV. fig. 13). It shows the immense size of this female hybrid. This female is, however, not so closely allied to the type of *curtula* as the two individuals bred in 1897, which unfortunately escaped. The capabilities of development of the eggs of this female could not be ascertained this time, as not a single *Pygæra* male, either of hybrid or pure origin, was present at that time.

females had distributed in the breeding-cage masses of eggs, which seemed to be normally constructed, and whose capabilities of development should be proved. How are these curious results to be explained?

The fact, that in our experiments the male *Pygæra* hybrids develop much quicker than their sister females, and that the male hybrid immediately produces a big third generation of males, indicates a progressive developmental tendency, which is further confirmed by other facts. But above the tendency to progressive development in a biological and morphological direction, is the law again to the fore among these *Pygæras*, that the characters of the oldest phylogenetic species are impressed upon the offspring; we will, however, not reiterate this question.

On the other hand, with regard to the females of the *Pygæra* hybrids, they later endeavour to return to the original simple one generation during the year (for this was certainly the primitive condition). This state comes about sometimes directly; and, moreover, the females of this hybrid form, both as larvæ and imagines, revert to a greater degree than the males to the oldest phylogenetic form.

It is quite a common character of the Lepidoptera (of which I have mentioned several important facts in my Handbook) that the male individuals have a well-marked tendency to progression, and to the creation of new forms; whereas the females are more conservative, and, in some cases, show a tendency to retrogress. If we now regard the hybrids, who, in comparison with individuals of pure origin, must be conceded to have a greater freedom and individuality in their evolution, their development is not influenced by the junction of two germs which are pushing forward in the same direction, but by the junction of influences pushing in two opposite directions: in the male sex a tendency to development in a definite and progressive direction; in the female, an opposing tendency to retrogress. The tendencies directing development, which are here forced upon our notice, are no doubt inherent sexual peculiarities, or, as we may well say, sexual characters which have become constitutional. Unfortunately we can only give a passing notice to this extraordinary fact.

From these new hybridization experiments we have, firstly, filled the gap in our former hybridization experiments.¹⁶ There have now actually been found, from three different crossings, primary hybrid females which are apparently normally formed,

¹⁶ As will be seen in footnotes 11 to 14, the crossing experiments with *Drepana falcatoria* and *curvatula*, and with *Pygæra pigra*, Hfn., *curtula*, L., and *anachoreta*, F., were repeated in 1898. Not only these, but a number of new experiments were added to those already made with the Bombycid species.

and have scarcely a less number of eggs in their ovaries than is averaged by the pure species. The in-breeding of two of these hybrids resulted in eggs from which emerged a number of larvæ (see footnotes 11 and 12), which, however, up to the present, have not been successfully reared.

Secondly, they have confirmed that the physiognomical aspect of the hybrid will be mainly influenced by the phylogenetic oldest species.

Thirdly, subordinate to this law, certain characters found more or less pronounced expression (especially with hybrids of the genus *Pygæra*), which may be regarded constitutional to the sexes of *Lepidoptera*, viz.: in the male, a tendency to progressive development; in the female, conservative tendencies and inclination to retrogress.

To gain a quick and systematic view of the matter, the following twelve hybrid broods were obtained:—

$$20. \quad \text{Drepana} \frac{\text{curvatula Bkh. } \delta}{\text{falcataria L. } \varphi}$$

$$21. \quad \text{Drep.} \frac{\text{falcataria } \delta}{\text{curvatula } \varphi}$$

$$22. \quad \text{Drep.} \frac{\left(\frac{\text{curvatula } \delta}{\text{falcataria } \varphi} \right) \delta}{\left(\frac{\text{curvatula } \delta}{\text{falcataria } \varphi} \right) \varphi}$$

$$23. \quad \text{Pygæra} \frac{\text{nigra Hfn. } \delta}{\text{curtula L. } \varphi}$$

$$24. \quad \text{Pyg.} \frac{\text{curtula } \delta}{\text{pigra } \varphi}$$

$$25. \quad \text{Pyg.} \frac{\text{curtula L. } \delta}{\text{anachoreta F. } \varphi}$$

$$26. \quad \text{Pyg.} \frac{\text{anachoreta } \delta}{\text{curtula } \varphi}$$

$$27. \quad \text{Pyg.} \frac{\left(\frac{\text{pigra } \delta}{\text{curtula } \varphi} \right) \delta}{\left(\frac{\text{pigra } \delta}{\text{curtula } \varphi} \right) \varphi}$$

$$28. \quad \text{Pyg.} \frac{\left(\frac{\text{curtula } \delta}{\text{pigra } \varphi} \right) \delta}{\left(\frac{\text{curtula } \delta}{\text{pigra } \varphi} \right) \varphi}$$

$$29. \quad \text{Pyg.} \frac{\left(\frac{\text{curtula } \delta}{\text{anachoreta } \varphi} \right) \delta}{\left(\frac{\text{curtula } \delta}{\text{anachoreta } \varphi} \right) \varphi}$$

$$30. \quad \text{Pyg.} \frac{\left(\left(\frac{\text{curtula } \delta}{\text{anachoreta } \varphi} \right) \right) \delta}{\left(\frac{\text{anachoreta } \delta}{\text{anachoreta } \varphi} \right) \varphi}$$

$$31. \quad \text{Pyg.} \frac{\left(\frac{\text{anachoreta } \delta}{\text{curtula } \varphi} \right) \delta}{\left(\frac{\text{anachoreta } \delta}{\text{curtula } \varphi} \right) \varphi}$$

From a number of pairings of Nos. 22, 27, and 28, a small number of larvæ were obtained, but they were never successfully reared. The whole of these creatures showed evident signs of want of energy. The remaining nine crossings were all reared to the imago, some of them in numbers.

The hybrid of *Drepana curvatula* ♂ × *falcataria* ♀ (No. 20) is, as already stated, figured (Pl. IV. figs. 5 and 6), being a male and female; Pl. IV. figs. 8 and 9, show a pair of the reciprocal hybrid No. 21. Of No. 20 the males and females emerged together, whereas in No. 21 the male imagines soon emerged, but none of the females developed at once, but hybernated as pupæ. This biological difference was already very apparent during pupation. The male individuals only bent round a small portion of the edge of the leaf, fixed to the same in its concave shape by a few small threads on the surface, and changed to a

pupa in this more or less open pocket. The females, on the other hand, rolled a large portion of the leaf sharply around, beginning at the edge, and closed over the so-formed pocket with numerous strong silk threads, with the exception of a small opening to allow the larva egress, and then gnawed this cocoon loose from the rest of the leaf, so that it fell to the ground, or rather into the sleeve, and then fastened up the opening. In this manner the pupa was better protected against many dangers than if it fell, in late autumn, with the rest of the leaves. These females also had regularly a number of eggs in their ovaries, the developing powers of which have, however, not as yet been ascertained.

Both hybrids Nos. 20 and 27 are nearer to *Drepana curvatula* than *falcatoria*, but it cannot be determined, with accuracy, as to whether the male has a stronger influence on the aspect of the hybrid than the female, on account of the limited number of imagines of cross No. 21 as yet obtained.

Pl. IV. figs. 9 and 10 shows a female and a male of the crossing between *Pygæra pigra* ♂ × *curtula* ♀ No. 23; and, as we have already seen, Pl. IV. figs. 11 and 12, a female and male of the reciprocal cross No. 24. As in the latter, so in the former, the males emerged previous to the females, but not with such a great interval of time as in No. 24. It was, therefore, possible to obtain numerous in-breeds of No. 23 without resorting to artificial means to keep back the males. It was not, however, found possible to rear the numerous offspring of this hybrid, as the larvæ died soon after leaving the egg. Both crossings Nos. 23 and 24 are nearer to *pigra* than *curtula*; but the females have a prevailing influence on the aspect of the hybrids, if either sex predominates.

Pl. IV. figs. 15 and 16 shows a pair of hybrids of *P. anachoreta* ♂ × *curtula* ♀ No. 26. The reciprocal hybrid No. 25, which is figured Pl. IV. figs. 13 and 14, has already been dealt with in the text and in footnote 14. Both forms are nearer the phylogenetically older form *curtula* than the younger *anachoreta*; but, in a subordinate manner, the influence of the male prevails in the aspect of these reciprocal hybrids.

The hybrid No. 26 is very difficult to obtain, and, according to the present experiments, only gives a small percentage of living progeny. In 1898, out of six pairings, each of which contained from 150 to 200 eggs, only seventy larvæ were obtained, and from which only twenty-seven imagines were bred. Two of these insects were females, both of small size, whose ovaries could only hold a few eggs. One of these females is figured, Pl. IV. fig. 15.

Further, appeared among these hybrids an individual with wonderfully irregular colour tones, light and dark, grey and brown being mixed up together in the colouring of the upper side of the right and the under side of the left fore wings. Perhaps this is a gynandromorphic form, as the (unfigured) female actually has a darker coloration than any of the males. The antennæ of this specimen are true male, but it possesses a monstrous abdomen, of which more later.

Further, among the twenty-seven hybrids were three specimens, which, although to all appearances male, did not have the abdomen composed of the usual nine segments; the specimen just mentioned above also comes under this head. Two of these specimens had the seventh abdominal segment developed to its proper extent on the left side only, and the remaining two had this same seventh segment properly developed only on the right side, decreasing in size, in all four cases, to the middle of the back, and beneath to the middle of the belly, and disappearing towards the opposite side of the

body. This monstrous growth was noticeable when the larvæ emerged from the egg, and remained throughout all their stages to the same degree and extent.

The twenty-one remaining individuals were ordinary males (Pl. IV. fig. 16). One of them paired with a female of *P. curtula*. From this brood male imagines were quickly obtained, which were very close to *P. curtula*, cross No. 31.

These males were not used for further experiments. The female individuals of this secondary hybrid did not emerge at once, but remained in pupæ over the winter, and emerged in the spring of 1899. They are also very like *P. curtula*, and are sexually well developed; when paired with *P. curtula* ♂ large broods were obtained. These experiments are at present still being pursued, so I must save information as to their results for a later publication.

CONCLUSION.

The results of our Hybridization Experiments can only support the original idea as to the formation of species, expressed as an introduction to these experiments.

We found by this examination of the physiological divergences and differences of related types that the various pairs of species are related to each other in very varying degrees. But this observation was to be expected on the assumption of a gradual separation and evolution of related forms going on alike in the past, present, and future.

Beginning with pairs of species, with which one was able to effect crossings, without, however, their being capable of producing offspring, and with such degrees of relationship that hybrid offspring could be obtained, but apparently without life energy (crosses Nos. 4 and 7), there were further evinced many steps to a higher and higher physiological affinity between the various pairs of species experimented with, until at last, although not to a very high degree, hybrids were found (crosses Nos. 22, 27, and 28) which were actually capable of reproduction, although their offspring were not successfully reared. In another case, by crossing back the primary hybrid male with one of the parents (pp. 17 and 18, crossing No. 13), the physiological affinity was so far restored that a hybrid was produced which was capable of reproduction in a slight degree, and from which two male offspring were actually bred to the imago (cross No. 18, also p. 18, footnote 5).

A lengthy period of existence, phylogenetically speaking, of the divergence between nearly related types, according to our experiments, is in no way connected with the higher degree of difference on the lines of biological, physiognomical, and physiological characters than between pairs of species which have been divergent for a lesser period, even when nearly related groups of species are in question. The long separated *S. pavonia* and *spini* are, in most of their characters, less separated from each other than the later formed *S. pyri* from either of them.

Ordinary selection between differently formed individuals, in the sense of Weismann's pre-formation, cannot, we think, account

for these appearances. We should be far more inclined to say that the divergence was, in the first instance, the direct result of certain modifying factors of nature, one of which would be temperature, whose undeniable effects in changing the aspect of species we have already seen in the temperature experiments. It is easily understood that a factor causing slight divergence during a long period would have less result than a factor causing strong divergence in a shorter. Perhaps the capability of reaction or change is increased when certain individuals, through the influence of natural factors, have been driven from a condition of relative stability to one of unstable equilibrium. The probability of this theory is confirmed by certain groups of the Lepidoptera, in their, one might say, explosive change of form, for example, in the tribes of *Zygæna* and *Agrotis*. Among plants, the families *Hieracium*, *Rubus*, and *Rosa* seem to be similarly situated.

[The four plates accompanying Mr. Dadd's translation of Prof. Standfuss's paper are reduced copies of the originals in 'Insekten Börse,' 1899, published by Frankenstein & Wagner, of Leipzig.]

NAMES OF LEGS OF INSECTS.

By G. H. VERRALL, F.E.S.

WHEN will entomologists of the present time correctly name the legs of insects?

All entomologists know that insects have three pairs of legs, but after that (in at least Dipterology) they seem to be in hopeless confusion.

The three pairs of legs are—

1. Front legs=*Pedes antici*.
2. Middle legs=*Pedes medii*.
3. Hind legs=*Pedes postici*.

For convenience there exist the combinations of—

1. } Anterior legs=*Pedes anteriores* (excluding "*postici*").
2. }
2. } Posterior legs=*Pedes posteriores* (excluding "*antici*").
3. }

Let it be clearly understood that there is only

ONE pair of front, middle, or hind legs;

but that there are

Two pairs of anterior or posterior legs.

The above definition, of course, applies to parts, such as femora, tibiæ, tarsi, &c.

Anterior does NOT mean front only.

Posterior does NOT mean hind only.

CATALOGUE OF THE LEPIDOPTERA OF IRELAND: SUPPLEMENTARY LIST.

By W. F. DE VISMES KANE, M.A., M.R.I.A., F.E.S.

(Concluded from p. 16.)

BUPALUS PINIARIA, *L.*—Near Kildare (*Freke*).

STERRHA SACRARIA, *L.*—One taken at Timoleague, Co. Cork, 27th August, 1898, by Mr. R. Donovan.

ABRAXAS SYLVATA, *Scop.*—Kenmare (*R. E. D.*).

HYBERNIA RUPICAPRARIA, *Hb.*—Sligo (*McC.*).

H. AURANTIARIA, *Esp.*—Enniskillen (*P.*).

CHEIMATOBIA BOREATA, *Hb.*—Achill Island, Connemara (*R. E. D.*).

OPORABIA DILUTATA, *Bkh.*, and O. AUTUMNATA, *Bkh.*—The notice of *O. autumnata* and the two allied species by Mr. Prout in the March number of the 'Entomologist' for this year has again called my attention to the question of the distinction of these three alleged species. I have already noted the occurrence of a form from the Belfast hills, recognised by Mr. Barrett as probably *O. autumnata*, Gn. From a careful survey of a long series of *Oporabias* in my own collection, I cannot detect any which conform to Mr. Prout's diagnosis of the latter species. For the most part, however, they are woodland examples; and, though very varied, belong to the varietal forms of *O. dilutata*. *Ab. christyi* is one of the most numerous from Hazlewood, Sligo, and Mucross, Killarney, cf. Ent. xxxiii. pl. ii. figs. 7, 8, 9, 10; while fig. 14 is also represented from three or four localities. There are, moreover, some very beautiful forms with very white ground barred with four sharply defined fuscous bands. I trust that Irish lepidopterists, with Mr. Prout's paper to assist them in diagnosis, may for the future pay more attention to this interesting group.

LARENTIA FLAVICINCTATA, *Hb.*—At Murlough Bay, Ballycastle, Co. Antrim, the long grassy slopes which stretch up from the sea to the foot of the chalk cliffs are full of *Saxifraga hypnoides*, the food-plant of this species. It was here resting on the rock face that in 1897 that I met with numerous worn and a few fresh examples of this moth, a new addition to the Irish fauna. Probably it will be found all round the Antrim coast-line, and elsewhere, as in Sligo and the Burren of Clare, where this saxifrage is plentiful.

L. SALICATA, *Hb.*—Dromoland, Co. Clare (*Hon. E. O'B.*).

EMMELESIA TÆNIATA, *St.*—Timoleague, Co. Cork (*R. D.*).

EUPITHECIA PULCHELLATA, *St.*—Timoleague, Co. Cork (*R. D.*).

E. SUBFULVATA, *Haw.*—Timoleague, Co. Cork (*R. D.*).

E. SCABIOSATA, *Bork.*—Timoleague, Co. Cork (*R. D.*).

E. PLUMBEOLATA, *Haw.*—Timoleague, Co. Cork (*R. D.*); Dromoland, Co. Clare. Three at Clonbrock (*R. E. D.*).

E. ISOGRAMMATA, *H.-S.*—Clonbrock (*R. E. D.*).

E. PYGMÆATA, *Hb.*—Ardtully, near Kenmare, one; Timoleague, Co. Cork (*R. D.*).

E. JASIONEATA, *Creve.*—One at Timoleague, Co. Cork (*R. D.*).

E. VIRGAUREATA, *Dbl.*—Plentiful at Timoleague, where Mr. Donovan reports two annual emergences, and has taken the larvæ both on *Solidago virgaureæ* and ragwort.

E. VALERIANATA, *Hb.*—Dromoland, Co. Clare, not rare (*Hon. E. O'Brien*); Timoleague, Co. Cork (*R. D.*).

E. INDIGATA, *Hb.*—Mr. Allen writes that he was not the captor of this species near Galway. The locality was Merlin Park, where the food-plant grows in great abundance.

E. CONSTRICTATA, *Gn.*—Near Clonakilty, Co. Cork (*R. D.*).

E. LARICIATA, *Frr.*—Sligo (*McC.*).

E. DODONEATA, *Gn.*—Sligo (*McC.*). Mr. Allen writes that the Galway record attributed to him is an error.

E. TOGATA, *Hb.*—Dalyston, near Loughrea, Co. Galway, abundant; Enniskillen (*P.*); Dunmanway, Co. Cork (*R. D.*).

EUPITHECIA DEBILIATA, *Hb.*—Abundant at Timoleague, Co. Cork. Mr. Donovan has taken one unicolorous specimen also.

LOBOPHORA SEXALISATA, *Hb.*—Timoleague, Co. Cork (*R. D.*).

L. HALTERATA, *Hb.*—Pontoon, Foxford, Co. Mayo.

L. VIRETATA, *Hb.*—Dromoland, Co. Clare (*Hon. E. O'Brien*).

MELANIPPE TRISTATA.—The Burren of Clare, local; Dalyston, near Loughrea.

PHIBALAPTERYX VITTATA, *Bork.*—Killarney (*R. E. D.*); Timoleague, Co. Cork (*R. D.*); Dromoland, Co. Clare, abundant.

TANAGRA ATRATA, *L.*—Near Belleek, Co. Fermanagh (*J.*).

PYRALIDES.

SCOPARIA BASISTRIGALIS, *Knaggs.*—Timoleague, Co. Cork (*R. D.*).

S. MERCURELLA, *L.*—Timoleague, Co. Cork (*R. D.*).

S. RESINEA, *Haw.*—Timoleague, Co. Cork (*R. D.*).

S. ANGUSTEA, *St.*—Timoleague, Co. Cork (*R. D.*).

OROBENA STRAMINALIS, *Hb.*—Timoleague, Co. Cork (*R. D.*).

PTEROPHORI.

PLATYPTILIA BERTRAMI, *Rüssl.*—Bundoran (*J.*); Clonbrock (*R. E. D.*); Timoleague, Co. Cork (*R. D.*).

P. ISODACTYLUS, *Zell.*—Knockagh, near Carrickfergus (*W.*).

P. GONODACTYLA, *Schiff.*—Kenmare (*R. E. D.*).

P. TESSERADACTYLA, *L.*—Since writing my notice of this species, new to the British Islands, my expectation of discovering new haunts has been fulfilled. Many fresh areas about Ardrahan, Co. Galway, and thence through the Burren of Clare to Corcumroe and Ballyvaughan, have furnished specimens; so that there is no doubt that the species is spread over a very large area in Clare and Galway.

AMBLYPITILIA ACANTHODACTYLA, *Hb.*—Woodenbridge, Co. Wicklow (*G. V. H.*); Timoleague, Co. Cork (*R. D.*).

OXYPTILUS PARVIDACTYLUS, *Haw.*—Clonbrock (*R. E. D.*).

LEIOPTILUS LIENIGIANUS, *Zell.*—Kenmare (*R. E. D.*); Sligo (*R.*).

L. TEPHRADACTYLUS, *Hb.*—Dromoland, Co. Clare; Clonbrock (*R. E. D.*).

L. MICRODACTYLUS, *Hb.*—Clonbrock (*R. E. D.*); Sligo (*R.*).

ACYPTILIA GALACTODACTYLA, *Hb.*—Two at Kenmare (*R. E. D.*).

A. BALIODACTYLA, *Zell.*—Sligo (*R.*).

A. TETRADACTYLA, *L.*—Kenmare (*R. E. D.*); Ballyvaughan, Co. Clare.

A. PENTADACTYLA, *L.*—Dromoland, Co. Clare, a few. (*Hon. E. O'Brien*).

CRAMBI.

SCHÆNOBIUS FORFICELLUS, *Thnb.*—Sligo (*R.*); Timoleague, Co. Cork (*R. D.*).

PHYCIDÆ.

HOMÆOSOMA BINÆVELLA, *Hb.*—Timoleague, Co. Cork (*R. D.*).

NEPHOPTERYX SPLENDIDELLA, *H.-S.*—Timoleague, bred by Mr. R. Donovan from larvæ feeding in spruce fir-cones.

RHODOPHÆA CONSOCIELLA, *Hb.*—Timoleague, Co. Cork (*R. D.*).

ZELLERIA PHILLYRELLA, *Mill.*—Since recording the capture of one specimen of this moth by the Rev. Canon Cruttwell, at Renvyle, Connemara, “among heather on the mountain side, though very near the plantation” (*in litt.*), I visited the locality. Unfortunately a tempest of wind and rain made collecting impossible. But I carefully examined the garden and plantations, and can confidently state that no species of *Phillyrea* grows there; nor is there, for many miles round, any shrubbery in which the plant could be looked for. In my correspondence on the subject with Mr. C. G. Barrett he wrote as follows:—“It is not always the habit of a *Zelleria* to keep close to its food-plant. It likes to hide in any dense cover. The nearest ally of *Zelleria phillyrella* is *Z. hepariella*. This species has long been known to frequent yew (*Taxus baccata*), and to be obtained by beating that tree. Its larva was there confidently looked for upon it, and it

came quite as a surprise when the insect was discovered to be an ash feeder! This makes it very probable that *Z. phillyrella* had only hidden itself among heather, and had fed on something quite different." From indications obligingly given me by Canon Cruttwell, I think that the spot in which he captured it will be found by turning to the right out of the Renvyle gate, and following the road bordered by the plantation to nearly the end of the trees. Here there are ash growing; and as *Phillyrea* belongs to the natural order of Oleaceæ (olive worts), as also ash, privet, and lilac, it seems likely that further research will establish Mr. Barrett's suggestion as correct, and that the phenomenal occurrence of this rarity in the extreme wilds of Connemara will be satisfactorily explained. I have to thank Canon Cruttwell and Mr. Barrett for their very obliging letters and information.

ADDENDA.

The following information has just come to hand from J. E. R. Allen, Esq., of Portora, Enniskillen:—

LITHOSIA DEPLANA, Esp.—One taken at Killarney, identified by Mr. Prout.

TRIPHENA ORBONA, Hufn. (*subsequa*, Hb.)—One at Lisbellaw, which I have examined.

TETHEA SUBTUSA, Fb.—Recorded already from near Enniskillen. Mr. Allen informs me that it is frequent in the various islands of lower Lake Erne.

EUCLIDIA GLYPHICA, L.—Common about Enniskillen.

EURYMENE DOLOBRARIA, L.—One at Enniskillen.

DESCRIPTIONS OF TWO NEW SPECIES OF PHYLLOMORPHINÆ (HETEROPTERA: FAM. COREIDÆ).

By W. L. DISTANT.

THE Phyllomorphinæ constitute a small subfamily of the Coreidæ, of which at present only three genera and some thirteen species are known to entomologists. They are in structure the most aberrant forms of all Coreids, and their phylogeny is quite unworked. Three species are recognized in the western Palæarctic region, and are located in the true genus *Phyllomorpha*. The two other genera, *Pephricus* and *Craspedum*, are almost entirely Ethiopian in distribution. Westwood described and figured an Indian species. We have evidently, at present, a very slight knowledge of the Phyllomorphinæ.

The old Swedish traveller in South Africa, Dr. Sparrman, who first discovered (1775) the curious *Pephricus paradoxus*, was impressed by its mimetic resemblance to a leaf. He narrates:—"At noontide I sought for shelter among the branches of a shrub from the intolerable heat of the sun. Though the air was now extremely still and calm, so as hardly to have shaken an aspen leaf, yet I thought I saw a little withered, pale, crumpled leaf, eaten as it were by caterpillars, fluttering from the tree. This appeared to me so very extraordinary, that I thought it worth my while suddenly to quit my verdant bower in order to contemplate it; and I could scarcely believe my eyes when I saw a live insect, in shape and colour resembling the fragment of a withered leaf, with the edges turned up and eaten away as it were by caterpillars, and at the same time all beset with prickles. Nature, by this peculiar form, has certainly extremely well defended and concealed, as it were in a mask, this insect from birds and its other diminutive foes."*

We know most about the European species. *Phylломорpha laciniata* has been well observed. Bolivar has described its stridulation and mode of carrying eggs; † and Giard has also written on its habits. ‡

Pephricus fragilis, sp. n.

Varying in colour from pale creamy white to ochraceous; pronotum with the base slightly concave, the lateral lobes broadly gibbous anteriorly, their apices somewhat obliquely truncate, the abdominal lobes broad with their apices truncate, a more or less distinct transverse fuscous fascia crossing abdomen beyond middle and extending through the fourth and longest lobe; the upper surface varies in the number and position of some scattered small fuscous spots.



P. fragilis, Dist.

Long. ♂ and ♀ 12 millim.

Hab. West Africa; N. Nigeria (G. Migeod—Brit. Mus.); Abyssinia (Brit. Mus.).

Allied to *P. pellicula*, Westw., but differing by the broader anterior angles of the pronotal lobes, &c.

* 'Voyage to Cape of Good Hope,' Engl. transl. 2nd edit., vol. ii. p. 16.

† Feuille Natural., xxiv. pp. 43-4 (1894).

‡ Bull. Soc. Ent. Fr. p. lxxix. (1895).

Pephricus fasciatus, sp. n.*P. fasciatus*, Dist.

Ochraceous ; a broad fuscous fascia traversing the pronotum and its lateral lobes, and another crossing the abdomen and extending through the fourth abdominal lobe and occupying the whole of its apex ; apex of the fifth abdominal lobe also fuscous. A few irregular scattered small fuscous spots on the upper surface.

Long. 11 millim.

Hab. West Africa (Brit. Mus.).

Allied to *P. livingstoni*, Westw., but differing by the truncate apices of the abdominal lobes, &c.

NOTES ON SOME COCCIDÆ OF THE EARLIER WRITERS.

By T. D. A. COCKERELL.

IN the course of my bibliographical investigations among the earlier works treating of Coccidæ, I have found so much that has been misunderstood by later writers, that it seems worth while to report the following results, although the more startling discoveries are not here mentioned, having been set forth in Proc. Acad. Nat. Sci. Philadelphia, 1899.

PULVINARIA VITIS (L.); *Coccus vitis*, L., S. N. x. 1758, p. 456.—This is the well-known *Pulvinaria* of the vine, well figured by Réaumur, whose figure is duly cited. *Calypticus spumousus*, Costa, Faun. Nap. 1829, is said to be the same, in which case *Calypticus* apparently takes the place of *Pulvinaria*, and the species becomes *Calypticus vitis* (L.).

PULVINARIA MESPILI (Gmel.); *Coccus mespili*, Gmel., Syst. Nat. 1788, p. 2221.—This is based on Geoffroy, Ins. Par. i. p. 508, No. 16. Fonscolombe in 1834 describes *Coccus cratægi*, Fb., and gives *mespili*, Geoff., as a synonym. Signoret says this is *mespili*, but not *cratægi*, which is *oxyacanthæ*, L. Fonscolombe's description evidently relates to a *Pulvinaria*. Signoret later referred Geoffroy's insect to *Pseudococcus* (i. e. *Phenacoccus*), which is evidently an error.

PULVINARIA SERICEA (Fourc.); on oak near Paris, *lanata*,

Gmel., is said to be the same. This is Geoffroy's oval and cottony *Chermes* of the oak.

PULVINARIA BETULÆ (L.) ; *Coccus betulæ*, L., S. N. x. 1758, p. 455.—Linné in the place cited gives no description, but refers to 'Fauna Suecica.' The latter work informs us that it occurs solitary on the branches of *Betula alba*, but still gives no description. Fabricius says of the insect, "corpus minutum, album," and cites only Linné. I have seen only the 'Fauna Suecica' of 1761, and do not know what an earlier edition may contain; but on the face of things there seems nothing to prove that the Linnean insect is the *Pulvinaria betulæ* of Signoret and authors, or even a *Pulvinaria*.

PULVINARIA CARPINI (L.) ; *Coccus carpini*, L., S. N. x. 1758, p. 455.—Signoret says this is the same as Réaumur's pl. vi. figs. 5, 9, 11. These three figures are all *Pulvinaria*, but fig. 5 is the type figure of *P. vitis*; fig. 9 is a species on oak, I suppose *P. sericea*; fig. 11 is the type figure of *P. oxyacanthæ*. It seems very doubtful whether the Linnean *carpini* can be identified, but Signoret's *carpini* is presumably identical with *Lecanium carpini*, Ratzeburg, Forstins. iii. p. 194, pl. ii. f. 6.

The whole question of the classification of the European species of *Pulvinaria* needs to be reconsidered, both as to the validity of the species, and the correct application of the names currently assigned to them.

LECANIUM, Illiger, in Burmeister, 'Handbuch der Entomologie,' ii. pt. i. 1835, p. 69.—The first species mentioned is *L. hesperidum* (L.), which must be regarded as the type. *Calymnatus*, Costa, with the same type, dates from 1827 or 1828, and therefore has priority, unless an earlier publication of *Lecanium* can be discovered. Scudder, following Agassiz, writes *Lecanium*, Burm., 1835, in the 'Nomenclator Zoologicus.'

The following species, hitherto placed in *Lecanium*, are the more typical members of *Calymnatus*:—*C. hesperidum* (L.), *C. longulus* (Dougl.), *C. minimus* (Newst.), *C. viridis* (Green), *C. schini* (Ckll.), *C. flaveolus* (Ckll.), *C. nanus* (Ckll.), *C. acuminatus* (Sign.), *C. terminaliæ* (Ckll.), *C. angustatus* (Sign.), and a few others. *Eulecanium* and *Saissetia* ought probably to be regarded as distinct genera.

EULECANIUM FUSCUM (Fourc.) ; *Chermes fuscus*, Fourcroy, 1785 ; *Coccus fuscus*, Gmel., 1788, in part.—Fourcroy's name is based on Geoffroy's account (Ins. Par. i. p. 507, No. 11); Geoffroy says the species seems not to differ from that of the elm, but he quotes Réaumur's pl. v. fig. 2, which has the appearance of a *Kermes*. Douglas (Ent. Mo. Mag. 1887, p. 98) declares that Réaumur's figure represents a *Lecanium* known to him, even in details of marking; but to me the shape and mode of attachment to the twig indicate a species of *Kermes*. Gmelin's account of the insect seems decidedly mixed, and he says of it,

"albo tomento obductus." His first citation of literature is "Modeer, Act. Gothenb. i. p. 24, § 18"; Douglas says that Modeer's insect is Geoffroy's *Chermes quercus reniformis*, i.e. *quercus* (L.), which is a *Kermes*.

EULECANIUM CORYLI (L.); *Coccus coryli*, L., S. N. 1758, p. 456.—Based on Réaumur's figures, which represent a very convex *Eulecanium*.

EULECANIUM ALNI (Modeer, 1778); *Coccus alni*, Gmel., Syst. Nat. 1788, p. 2221.—Gmelin's account is entirely based on that of Modeer. Compare Douglas, Ent. Mo. Mag., September, 1886, p. 80.

EULECANIUM VINI (Bouché); *Lecanium vini*, Bouché, Stett. Ent. Zeit. 1851, p. 112.—The description is extremely short, but it may be possible to determine the species.

EULECANIUM TILIE (L.); *Coccus tilie*, L., S. N. x. 1758, p. 456.—Based on Réaumur's figures; the species is well known.

EULECANIUM PERSICÆ (Fabr., 1766); *Coccus persicæ*, Gmel., Syst. Nat. 1788, p. 2220; Fabr. Ent. Syst. 1798.—We used to think we knew this species, but it has lately become involved in obscurity. Fabricius in 1798 describes it as found on the peach, and having "corpus medium, subrotundum, inæquale, brunneum." Gmelin does not quote Fabricius, and describes it as "nitens, rubicundus, spadiceus aut niger." He quotes Modeer, Geoffroy, and Réaumur. Réaumur's figures represent an undeterminable Lecaniine on peach. Geoffroy quotes Réaumur's figures, and says the insect is round and brown, with four "filets" at its tail! Modeer's insect is the *Coccus persicæ rotundus*, which is, I suppose, Signoret's *L. rotundum* (credited to Réaumur), this being identical with *L. prunastri*, Fonsc. Signoret's *L. persicæ* is Réaumur's *Coccus persicæ oblongus*. I have not access to the descriptions of the supposed synonyms *costatus*, Schr., 1781, *persicorum*, Ramer, 1789, and *amygdali*, Fourcroy, 1785. The last was doubtless founded on Geoffroy's account.

L. prunastri, as shown by mounted specimens kindly lent to me by Mr. Theo. Pergande, has antennæ varying from 6- to 7-jointed, the respective formulæ (omitting the first joint in each case) being 3 6 2 5 4 and 4 (2 3) 7 6 5. In the 6-jointed form the suture between joints 3 and 4 of the 7-jointed form is obliterated.

COCCUS CLEMATIDIS, Gmel., Syst. Nat. 1788, is based on Geoffroy's account of a coccid on clematis. It is apparently a *Lecanium*, but Geoffroy seems to have mixed up Lecaniines and mealy bugs in a hopeless fashion.

Coccus uva, Gmel., Syst. Nat. 1788, if a coccid, can only be a *Margarodes*. The description reads, "C. testa fusca sphaericogibba subflavescens," and it is stated to be found in Sweden

under stones. This is apparently taken from Modeer, whose insect has hitherto been referred with doubt to *Orthezia urticæ*.

COCCUS TUBERCULATUS, Bouché, Nat. der Insekten, 1834, p. 18, pl. 1.—Found on Malvaceæ, and probably from South America. It is certainly a Lecaniine, and probably a *Pulvinaria*; but I have never seen anything exactly as described and figured. The antennæ are figured as 10-jointed, and there is a row of small tooth-like objects down the back.

ASPIDIOTUS MYRTHI, Bouché, S. E. Z. 1851, p. 112, has been erroneously catalogued as a *Chionaspis*; it appears to be a *Mytilaspis*.

East Las Vegas, New Mexico, U.S.A. : Jan. 2nd, 1901.

THE STUDY OF LIFE-HISTORY.*

"I have gathered a posic of other men's flowers, and nothing but the thread that binds them is mine own."—MONTAIGNE.

"THE life of individual man is of a mixed nature. In part he submits to the free-will impulses of himself and others, in part he is under the inexorable dominion of law. He insensibly changes his estimate of the relative power of each of these influences as he passes through successive stages. In the confidence of youth he imagines that very much is under his own control; in the disappointment of old age, very little. As time passes on and the delusions of early imaginations vanish, he learns to correct his more sanguine views, and prescribes a narrower boundary for the things he expects to obtain. The realities of life undeceive him at last, and there steals over him at times the knowledge that the things he has secured are not always the things he expected." †

Nevertheless, philosophically considered, the general trend of that life may be summed up in the one word "progression." And, as with individual man, so it is with groups of men, for communities are influenced by the same disasters, or complete the same cycle as the individual. Many never pass beyond infancy, some reach the vigour of manhood, whilst others perish suddenly or die of sheer old age. But though during existence they may not infrequently encounter ill-fortune, or what is popularly designated "bad luck," their absolute course can never be retrograde; in infancy, childhood, manhood, old age, it is ever onward. And as with communities in general, so it is with

* Address to the Lancashire and Cheshire Entomological Society delivered at the Royal Institution, Liverpool, on January 14th, 1901, by Vice-President E. J. Burgess Sopp, M.R.Met.Soc., F.E.S.

† J. W. Draper.

our own Society in particular—there can be no exception to the rule. Like an individual, it may experience its “ups and downs” of life, but—having successfully passed through the dangers incident to infancy and childhood, attained its majority, and (still under the able leadership of the respected President who has made it what it is) entered upon the vigorous growth of early manhood—its continued development and increased usefulness and prosperity can be looked forward to with the utmost confidence. This unchecked growth, or “healthy running on,” to use a horticultural expression, has imparted to the Society the same sound and healthful condition that it always does to the thriving plant; and just as, under like favourable circumstances, the latter is able to successfully withstand the very many trying vicissitudes to which it in its nature is exposed, so luckily is the Lancashire and Cheshire Entomological Society now far too strongly established to be injuriously affected by such ephemeral disasters as the possession of an inexperienced Vice-President or the delivery of a weak Annual Address.

To any member therefore who should happen to be present to-night for the first time, I would appeal that he judge not the calibre of the Society by this evening’s discourse, but rather regard the event as one of those momentary trials or adverse epochs in its history to which communities in common with individuals are exposed. To the older members I can only offer my condolences; like them, I sincerely regret the loss of the usual interesting Address by our worthy President, and still more deeply lament the cause which prevents him from being present amongst us this evening. Those of you who have so often enjoyed the great privilege of listening to the keen scientific observations and wealth of anecdotal experience of so veteran an entomologist as Mr. Capper will understand me when I say that although exceedingly attractive to listen to he is a difficult man to succeed, more especially for one who has so recently embarked upon the study of that branch of Natural History with which we are concerned this evening. Thus early does my difficulty begin.

A general survey of the entomological progress during the century just closed would have been desirable, but beyond me, and I thought it better to leave the matter untouched to a more able successor. A review of the work of the past twelve months had also to be abandoned, since owing to illness and other causes I have of late been sadly out of touch with the subject. Then in the presence of authorities like Mr. Pierce and the Rev. R. Freeman I could scarcely descant on the Lepidoptera, whilst it seemed equally presumptuous to address Dr. Ellis or Mr. Wilding on the topic of beetles. And alas! it is with the study of these two orders of insects that the majority of our members are concerned.

Since, then, it was obvious I could hope to discourse on little of interest to our older members, it struck me that as a comparatively young entomologist I might be permitted to address myself more particularly to the younger and less experienced students amongst us, and bring to their notice a few of the simpler of Nature's many secrets still awaiting solution at the hands of the zealous and thoughtful observer. By so doing I am not without hope that some may become sufficiently interested in the subject to eventually give more attention to a branch of the study of Zoology which appears somewhat neglected to-day—I refer to the study of life-history, an investigation requiring much careful training and long practice in observation, and which cannot therefore be well started too early in life.

This general neglect of attention to the living insect by beginners is easily understood. It matters not what order of Entomology we take up, our first endeavour is naturally to amass a collection; our next to get it named, classified, and arranged in the latest orthodox and most approved style. This is as it should be, provided always that the possession of such collection is not the object in itself; it should but serve us as a kind of illustrated catalogue to those wonderful little works of nature whose method of existence we should endeavour to fathom and understand. I think it was Bolingbroke, in his 'Letters on History,' who wrote:—"Some (histories) are to be read, some are to be studied, and some may be neglected entirely, not only without detriment but with advantage." The life-histories of insects undoubtedly belong to the earlier category, and should not only be read, but occupy a foremost place in any study of Entomology. True, the student of this branch of his subject has little to show of tangible form for much time and trouble expended. There will be few pocket-box exhibits for our energetic junior Secretary to insert in the monthly circular; no long columns of captures in the cabinet; and little enough for exchange: but on the credit side of his account will appear ere long ample and continually increasing compensation, with a wealth of genuine knowledge and pleasure to which the mere collector is for ever a stranger.

Far be it from me to underrate the work of classification. To H. T. Stainton and G. R. Waterhouse—who may perhaps be said to have been the first to reduce to a semblance of order the chaos existing in our lists of Lepidoptera and Coleoptera at the commencement of the nineteenth century—entomologists owe a deep debt of gratitude; and since their time so many and able have been the exponents of these groups along the same lines that their study has now been rendered comparatively simple. To such an extent indeed has the labyrinth of synonymy which formerly obtained been pruned, and to so great perfection has the general arrangement of the various groups of insects been

brought by the present generation of workers, that not only this Society but Entomology as a whole can now well afford to spare the labours of some of its younger and rising members, and should moreover encourage them, by every means in its power, to give increased attention to the important subject which I have ventured to bring to your notice this evening.

I have said *along the same lines*, but I do not admit those lines to be the best that could be desired. It is much more likely that the classification of our insects will eventually be considered historically; the ideal arrangement being based upon the development of internal structure and genealogy rather than upon any arbitrary divisions resting solely upon features of an external character as at the present day.

The study of life-history is in its broadest interpretation divisible into two portions, which may be conveniently described as—(1) observation of the habits of the living insect, and (2) the examination of its parts. The first of these can of course be pursued separately, but the diligent student who enjoys the advantage conferred by even a moderately good microscope will be well advised to combine the two, since some knowledge of the anatomy of his subject, no matter in how small a degree, will always be of great service to him in the intelligent interpretation of much in the life of an insect which may otherwise prove puzzling and obscure.

Of the systems of teaching of various naturalists with whose methods I have become acquainted, that of Döllinger, of Würzburg, was most successful; the fact that such men as Pander, Baer, and Agassiz were amongst his pupils speaks for itself. In our own times his system has been followed by the late Professor Huxley and other eminent workers; although at the present day the great bulk of zoologists in general—and I think I may add entomologists in particular—appear to be almost entirely engaged in renaming, reclassifying, and the rearrangement of generic and specific values, rather than in any systematic attempt to elucidate much that is as yet unknown of the habits and functions of the living animals themselves. That there are several distinguished exceptions I am well aware; their comparative smallness of number, however, seems but to accentuate the assertion advanced.

But that one epoch of life is not all life is a truism throughout the universe; and just as at one end of the chain of natural phenomena there are cycles or periods of time, at the expiration of which certain aspects of the giant heavenly bodies repeat themselves, and at the other well-marked though irregular and less understood recurrences of the abnormal assertion and activity of insect and other minute life; so, too, perhaps does the entomological student of life-history enjoy his periodicity, and in the fulness of time, through the exceedingly obscure albeit, usually

irresistible, force of fashion or other potent influence, may be evolved a race of entomologists whose chief aim and object will be the unravelment of the complicated skein of existence of living species rather than the collecting and arranging of their mummified forms after death. A list of such students, both in the past and present, includes many honoured names, of which it is only necessary to mention Malpighi, whose essay on the silkworm (1669) has been described as "an almost perfect example of an anatomical treatise in a new field" (Miall); Swammerdam, whose posthumous work 'The Book of Nature' contained the life-histories of many insects, of which perhaps that of the may flies (Ephemeridæ), although less quoted than the more elaborate dissertation on the honey bee, is the more valuable; Lyonnet, who has charmed us with his observations on the larva of the goat moth (*Cossus ligniperda*); Réaumur, the French naturalist, whose chief work, 'A History of Insects,' contains an admirable account of the caddis worms (Trichoptera); Straus-Dürckheim, whose classic exposition on the common cockchafer (*Melolontha vulgaris*) is a masterpiece of careful research; De Geer; Dufour; Newport; Leydig; Newman; Kirby; Professor Miall, to whom I am indebted for much of my knowledge of insect life; our member, Mr. S. L. Moseley, of Huddersfield, whose technical work in connection with injurious insects is known to you all; and last, but certainly not least, the distinguished lady whose membership is an honour to our Society, Miss Ormerod.

(To be continued.)

NOTES AND OBSERVATIONS.

TENIOCAMPA GRACILIS LAYING ITS EGGS IN A PIECE OF SPONGE.—On May 4th last I took a female of this species sitting in the daytime upon a frond of dead fern, and placed her in a large chip-box with a small piece of sponge saturated with syrup. She lived for a fortnight or more and then died, apparently without depositing any eggs, and I was on the point of throwing her and the piece of sponge away when something peculiar in the appearance of the latter caught my eye, and upon examining it closely through a lens, I discovered a quantity of eggs laid in the cells and placed some way in. They were of a pale straw colour when I first saw them, and remained so until May 28th, when they got a shade darker, and on June 1st I found many of the larvæ had hatched. They were then of a leaden hue, with shining black heads, and kept inside the sponge-cells, and I could not shake them out, so I placed the bit of sponge in a jam-pot with a piece of sawdust and covered them up; but the larvæ would not leave the sponge, and all died within the cells. I fancy they were held by the sticky syrup, and were unable to get out. This was unfortunate, but a piece of sponge seems to be a good thing to place in a box with moths that

do not readily lay in confinement, only, of course, the syrup must be omitted.—GERVASE F. MATHEW; Dovercourt, Essex, Feb. 11th, 1901.

SUGARING LAMPS.—Have there been any improvements lately in the manufacture of these lamps? If so, I should like to know. For the past two seasons I have been using one of the usual kind, as supplied by the dealers—one with bent glass front and burning a mixture of colza and American petroleum. It gives a fair light, but I think it might be vastly improved; the reflector seems to be a weak point. Has anyone invented any sort of electric lamp? I shall be glad to hear the experience of other collectors as to the best kind of lamp to use, &c., and where to obtain it.—GERVASE F. MATHEW; Feb. 12th, 1901.

PIERIS DAPLIDICE MIGRATING.—This species passed over here to-day (January 19th, 1901) in a large cloud, the time about 2·30, with a temperature of 101° in the shade. The butterflies appeared to be making for a north-westerly point; their progress was slow for such a high elevation, and the spectacle against the deep blue sky had the appearance as if studded with gems. On the ground they collected in batches where the spots were mostly damp and shady; towards sunset they had entirely disappeared.—H. W. BELL-MARLEY, I.L.I.; Ingagane, South Africa.

IRREGULARITY IN EMERGENCE OF DREPANIDÆ.—With reference to Mr. Leonard Spencer's observations on the length of time over which the emergence of *Drepana hamula* (*binaria*) extended (*ante*, p. 52), I may adduce for comparison my experience with *falcatoria* (*falcula*). I had a fine brood last summer, which pupated between the 16th and 27th July. Some were forced at about 90° F.; of these about half emerged at various dates extending from five to fifteen days; the other half were placed at the ordinary room temperature about the 11th August, when I went abroad. I returned 8th September, and found all these had emerged and died during my absence, except one, which was living and in good condition, and therefore could not have emerged earlier than about the 5th September. Some others were kept from the beginning at the room temperature; about half of these emerged in from seven to thirteen days, the rest while I was abroad, except one, which did not emerge until the 9th December. Many others were placed within a day or so after pupation at various low temperatures, mostly at about 48° F., and kept there for about fifty to seventy days, being brought into room temperature at intervals between the 16th and 28th September. Many of these emerged while at the low temperatures, but many others at various times afterwards, several of them in November and December, and one on the 12th January; as I have some healthy-looking pupæ remaining, I expect more. The artificial cooling to which most were subjected was a cause of much retardation, but it will be observed that the extreme irregularity in the appearance of the perfect form was not confined to these. The regularity of appearance of some summer insects—for example, *V. io* and *V. polychloros*—contrast strongly with this; I have often found all that pupated on the same date emerge on one and the same day.—F. MERRIFIELD.

ERRATUM.—Page 55, line 28, for "Derbyshire" read "Denbighshire."

CAPTURES AND FIELD REPORTS.

LIMENITIS SIBYLLA &C., IN SHROPSHIRE. — In August, 1900, I saw a fresh-looking *L. sibylla* at Hopton Court, near Cleobury Mortimer, Salop. Also I found a caterpillar of the same species, but, unfortunately, it died. *Grapta c-album*, *Vanessa (Cynthia) cardui*, *V. io*, were very common during that month, especially the latter.—C. R. L. BOXER; 151, Burnt Ash Hill, Lee, Kent.

CIRRHCEDIA XERAMPHELINA VAR. UNICOLOR IN THE MIDLANDS.—It may be of interest to record that, whilst living at Panton, in Lincolnshire, some forty miles from Nottingham, where Mr. A. Simmons took his specimen last year, I dug, in August, 1895, about twenty pupæ of *C. xerampelina*, under ashes, and from them had the good fortune to breed two lovely females of the var. *unicolor*. According to Mr. Tutt ('British Noctuæ and their Varieties,' vol. iii. p. 17), this form, besides occurring in Douglas, Isle of Man, has been recorded from Derbyshire, Gloucestershire, Staffordshire (Burton-on-Trent), and Yorkshire (Ripon). Staudinger, who gave it the name *unicolor*, describes it with terse accuracy as "alis anticis fere unicoloribus rufescentibus, flavo-bistrigatis." Guenée, who describes it as "var. A," but did not name it, says that the ground colour of the wings is a clear carnation red, and also remarks that the two sexes are similar. I find I have also a note that Mr. William Prest, of York, took one near that city, on Aug. 22nd, 1872. The ground colour is aptly described by him as being of a dull coppery red.—(Rev.) GILBERT H. RAYNOR; Hazeleigh Rectory, Maldon, Essex, Feb. 1st, 1901.

HYBERNIA PILOSARIA IN DECEMBER.—I took a fine specimen of *H. pilosaria* off a gas-lamp on Dec. 11th last.—CHARLES BAKER; Atherstone, Jan. 21st, 1901.

COLIAS EDUSA IN 1900, NEAR WINCHESTER.—I saw on the downs in the neighbourhood of Winchester, about Sept. 29th, a single specimen of *C. edusa*. This was the only specimen about, and I did not notice any clover or lucerne fields anywhere near.—ALAN W. CARDINALL; 18, Cromwell Road, Hove.

COLIAS EDUSA IN NORTHUMBERLAND.—On June 28th, 1900, I saw a single specimen of this butterfly on the roadside near Berrington, about seven miles south of Berwick. It was strong upon the wing, a male, in fine condition. I had expected to have seen others as in former years when the species has appeared here, but have not heard of a single other occurrence upon the eastern borders during the past season. The last previous occurrence of this species in the district of which I have any note was in 1884, when I saw one flying near Bamburgh, on July 14th. In 1877 it was numerous, and generally distributed.—GEORGE BOLAM; Berwick-on-Tweed, Jan. 28th, 1901.

COLIAS EDUSA AND ACHERONTIA ATROPOS IN NORTH ENGLAND.—During August, September, and October last, I was in different parts of Lancashire and Yorkshire, and saw *C. edusa* on one occasion only, that was on Aug. 14th, when I noted a specimen flying along the roadway by Cressington Park, five miles from Liverpool. I was told that the pupæ of *A. atropos* had been turned up in fair numbers by potato diggers in the Doncaster and Selby district.—G. B. OLIVER; Tetteuhall, Wolverhampton, Feb. 15th.

ACHERONTIA ATROPOS IN WARWICKSHIRE.—Among the many interesting reports of *A. atropos*, I have not observed any from Warwickshire. During August I had five fine larvæ brought to me, which had been found in various gardens near the town, and also one large pupa, which was found in a coal-heap in a garden, where one of the larvæ had also been obtained. Of the larvæ two failed to pupate successfully, but the other three changed all right. I adopted the forcing plan suggested by Messrs. J. and W. Davis, and am pleased to say I was rewarded with three very fine imagines, two females and one male. It would be interesting to hear if many of those reported in the larval state have successfully attained the perfect stage, and in what proportion as regards numbers.—CHAS. BAKER; Atherstone, Jan. 21st, 1901.

ACHERONTIA ATROPOS IN NORTHUMBERLAND, 1900.—This species has been unusually numerous in this district, in common with other parts of the country, during 1900. The following captures of larvæ have come under my notice, all upon the English side of the Border, and I have no doubt many others have occurred:—Sept. 1st. One at Smafield station, upon the main line of railway between Berwick and Belford; another, at the same place, about a week later. 5th. One at Lilburn Tower. 20th. One from a garden at Wooler. 22nd. One from Plea Piece. 18th. One near Ancroft; one, Holy Island. October. One at Brock Mill, near Beal. A year seldom passes without one or two of these strange-looking caterpillars being found in the district, the imago being much less frequently seen.—GEORGE BOLAM; Berwick-on-Tweed, Jan. 23rd, 1901.

EARLY APPEARANCE OF CHEROCAMPA ELPENOR.—On Jan. 9th I received from my friend Mr. M. F. Thomas, of Brecon, a very fine specimen of this moth, and he also kindly sent me the following particulars. The caterpillar was found during the first week in August last, among some lilies-of-the valley underneath a climbing white jessamine; after trying several things it was found to eat lettuce leaves. It pupated the last week in August, and was kept in a cardboard box on the mantelshelf of the smoking-room. The moth came out on Jan. 2nd. It is a beautiful specimen, perfect in every respect. Is not this a curious time of year for its emergence?—J. W. VAUGHAN; Bryn-y-Mon, Tenby, Jan. 12th, 1900.

THE VANESSIDS IN 1900.—The larvæ of *Vanessa urticae* were excessively abundant here last June and July, as usual, terribly ichneumonised. I noticed hundreds of their chrysalids hanging from copings of walls, &c., and collected several dozen, but not one produced a butterfly. However, in August and September the butterflies were tolerably common in clover-fields, but not abundant. *V. io* and *V. polychloros* were more numerous than usual, and *V. atalanta* was common, particularly in the larva state. Of *V. (Cynthia) cardui* I only noticed three—two very battered examples early in July, and one quite fresh on Sept. 5th. I was surprised there were not more of them, as they are usually plentiful during a clouded yellow year.—GERVASE F. MATHEW; Dovercourt, Feb. 11th, 1901.

NOTES FROM PORTLAND, 1900.—The following particulars respecting some of the best insects obtained here by me this season may be worth putting on record. *Colias edusa* was plentiful, and on the wing from Aug. 11th to Sept. 19th. I had one worn male brought me on June 12th, which I liberated. Of the variety *helice* I took six specimens. *C. hyale* I

captured here for the first time, netting six during the above period. Between Aug. 14th and Oct. 12th I had nine larvæ of *Acherontia atropos* brought me, the last two being only about one-third part grown, and these died. I took the first *Sphinx convolvuli* on Sept. 7th, and from this date until Oct. 9th I took seven others. On Sept. 25th I had a full-grown larva of this species brought to me, which had been dug up in a patch of potatoes. It went down again before I had time to examine it minutely, as I purposed doing, with a view to fully describing it. From the finding of this larva and the capture, some seasons, of a large number of the perfect insect, many in fine condition, I am inclined to think that the species breeds here. *Heliophobus hispidus* was out from Aug. 23rd to Oct. 7th, and I secured upwards of a hundred examples. Of *Aporophyla australis* I captured eighteen specimens, at sugar and on grass, between Sept. 21st and Oct. 7th. On Oct. 11th I took one *Epunda nigra* at sugar.—JOHN T. HYDE; The Grove, Portland.

LARVÆ-BEATING IN EPPING FOREST IN 1900. — Following on my previous notes published last year (Entom. xxxiii. p. 95), I append a short summary of larvæ beating in the above locality during the past year. The first excursion was on May 12th, to Loughton, and on this date the oaks were by no means in a forward condition. The day itself was bleak, and larvæ were few and far between; *Hylophila bicolorana* (three) was the most important item. On the 19th a similar journey resulted in an equal number of this species, and larvæ taken included *Crocallis elinguararia*, *Himera pennaria*, *Nyssia hispidaria*, and *Selenia tetralunaria*. On the 26th, walking through from Loughton towards the 'Wake Arms,' and beating suitable oaks, a very fair number of *H. bicolorana* were taken, ten in all. Many other larvæ were obtained, including the four above mentioned, and the more common things were fully as abundant as in the previous year. On June 2nd, isolated full-fed larvæ of *H. bicolorana* was the only species worthy of note. On the 9th, an excursion to Chingford, where the blackthorns came in for treatment, proved the fact that *Thecla betulæ* was well in evidence, and in point of numbers bid fair to outdo 1899. The larvæ were then very small; about twelve were taken, and more were to be had if one cared to work for them. *Miselia oxyacanthæ*, *Diloba cæruleocephala*, *Bombyx neustria*, *Odontopera bidentata*, were met with together, with a single *Trichiura cratægi*. On the 16th *T. betulæ* was exceedingly common, and from this date to the 30th many larvæ were to be had. Several collectors were working, and all with some success. It is extremely gratifying to those who know its locality well, to find that, despite the popularity of the Forest as a place for school treats, military manœuvres, &c., this insect holds its own against all comers. I consider, personally, the working of the generally-known locality by entomologists will never be sufficient to exterminate it, owing, I think, to two breeding-grounds in the near neighbourhood which, I believe, are little known, and less worked, by the majority of collectors. Among things which fell into the tray on the 23rd was a beautiful female specimen of *Eurymene dolabraria*, and this was equalled on the 30th by a fertile female of *Angerona prunaria*, in perfect condition, which laid freely in captivity.

On July 14th, an excursion to Loughton, walking towards Theydon, resulted in some interesting larvæ; oaks, poplars, birch and willows were touched, and the captures included three *Pterostoma palpina*, two *Noto-donta dictæa*, four *Lophopteryx camelina*, and three very small *Smerinthus*

ocellatus. On the 21st a further number of the above larvæ were taken, and others, including *Pygæra pigra* (?) and some *Eupithecia* larvæ (species unknown). On the 28th the most notable was a single *Macroglossa fuciformis*, which probably fell off honeysuckle.

On Sept. 7th a visit to the birches resulted in a single specimen of *Notodonta dromedarius*, three *Drepana falcataria*, five *D. lacertinaria*, and a few common larvæ.

To sum up, the year itself, so far as this locality is concerned, must be considered distinctly satisfactory; and though one regrets the absence of such larvæ as *Pæcilocampa populi* and *Thecla quercus*, yet the profusion of the others makes the Forest still worthy of the lepidopterist's attention.—E. W. LANE; 9, Teesdale Street, Hackney Road, N.E., Feb. 2nd, 1901.

LEPIDOPTERA IN CO. WESTMEATH.—As I have been collecting here for the last few years, a list of some of the insects I have met with may be of interest. Among others, I have taken the following species:—*Euchloë cardamines*, *Argynnis paphia*, *Melitæa aurinia*, *Vanessa io* (fairly abundant last season), *Thecla rubi* (very common), *Polyommatus phlæas*, *Chærocampa porcellus*, *C. elpenor*, *Smerinthus ocellatus* (larvæ abundant), *S. populi*, *Macroglossa stellatarum*, *Trochilium crabroniformis*, *Ino statice*, *Gnophria rubricollis*, *Euchelia jacobæ* (extremely common), *Phragmatobia fuliginosa*, *Leucoma salicis* (abundant, but very localized), *Orgyia antiqua*, *Saturnia carpini*, *Cilix glaucata*, *Cerura furcula*, *C. vinula*, *Lophopteryx camelina*, *Notodonta dromedarius*, *N. ziczac*, *Pygæra pigra*, *Cymatophora duplaris*, *Bryophila perla*, *Acronycta megacephala* (pupæ not uncommon), *A. rumicis*, *A. menyanthidis*, *Tapinostola fulva*, *Xylophasia sublustris*, *Neuronina popularis*, *Luperina testacea*, *Mamestra furva*, *Apamea unanimitis*, *Lamptetia arcuosa*, *Miana literosa*, *Celæna haworthii*, *Agrotis saucia* (not uncommon last year), *N. c-nigrum*, *Triphana interjecta*, *Nænia typica*, *Mormo maura*, *Panolis piniperda* (one), *Pachnobia rubricosa*, *Tæniocampa populeti*, *T. gracilis*, *Orthosia pistacina*, *Hadena dentina*, *H. pisi*, *Xylocampa areola*, *Calocampa vetusta*, *Xylina socia*, *Plusia bractea* (took eight specimens of this moth last season, and I have a number of the larvæ at present hibernating), *P. iota*, *P. pulchrina*, *P. festuca*, *Erastria uncula*, *Euclidia glyphica*, *Eurymene dolabraria* (one), *Crocallis elinguaris*, *Biston strataria* (one), *Amphidasys betularia*, *Tephrosia crepuscularia*, *Abraxas adustata*, *Lobophora carpinata*, *Thera firmata*, *Melanthia albicillata*, *Phibalapteryx vittata*, *Coremia designata*, *Cidaria miata*, *C. siderata*, *Tanagra atrata*.—B. L. MIDDLETON; Belsize House, Mullingar, Ireland.

NOTES ON THE SEASON OF 1900 IN CARNARVONSHIRE.—Sallows at Capel Curig, in Carnarvonshire, were not very productive. *Tæniocampa stabilis* and *T. gothica* were abundant; and *Pachnobia rubricosa* occurred sparingly, along with a few *T. incerta*. The varieties of this insect, where it occurs among the mountains, seem to be very remarkable and confusing. I found *Melitæa aurinia* very common on June 10th, in one of the localities near here, where I discovered it six years ago. I was not able to repeat my last year's excursions to Dinas Raddwy, in Merionethshire, where, in June, 1899, I captured between forty and fifty fine *Chærocampa elpenor*, at rhododendron bloom. They swarmed in scores at one small bush, along with a few specimens of *C. porcellus*. Sugar has been totally unproductive all the year, and light nearly as bad. Among the butterflies, *Vanessa io* has been very abundant this summer; *V. c-album* I saw twice.

I have, however, one addition to record to our small list of butterflies here. One of my boys, Master George Rowlands, took five specimens of *Thecla betulæ* in August, in a lane close by, which I have often worked myself, though without any such result. I was rather incredulous at first when I heard of its occurrence here; but I have seen the specimens, one male and four females, all rather worn. Larvæ and pupæ of *Acherontia atropos* have been found occasionally during the autumn in the neighbourhood.—A. S. TETLEY; Newtown, North Wales, Dec. 15th, 1900.

CAPTURES AT ELECTRIC LIGHT.—As Bucks appears to be a county which is little worked, a list of captures taken at electric light during the last year may prove interesting. We were only able to work the lamps on a few Saturday evenings in the months of May, June, and October, but we were able to give them more attention from July 20th to the end of September, with the exception of the first fortnight of August. Nearly all the moths enumerated were taken at five arc-lamps in the middle of the town, and the results would doubtless be better if the current were not switched off punctually at 11 o'clock. The only points worth noticing are the capture of *E. jacobææ* on April 21st (an early date), and the abundance of the "Thorns." *S. illunaria* (common), *E. tiliaria*, *E. fuscantaria* (common, but in poor condition), *E. angularia*, and *E. erosaria*, whilst one *H. pennaria* was taken on Nov. 3rd. Thirteen *C. xerampelina* turned up in September, and two *L. quercifolia* and one *N. trepida* in June. The following is a complete list of the species which were taken, one hundred and eleven in number:—

Sphinges:—*S. ligustri*, *S. ocellatus*.

Bombyces:—*L. complanula*, *E. jacobææ*, *A. caia*, *S. fuliginosa*, *S. lubricipeda*, *S. menthastri*, *H. humuli*, *H. lupulinus*, *L. auriflua*, *D. pudibunda*, *B. neustria*, *P. populi*, *T. cratægi*, *L. quercifolia*, *P. unguicula*, *P. hamula*, *P. falcula*, *C. spinula*, *N. dictæa*, *N. trepida*, *P. bucephala*.

Noctuæ:—*A. psi*, *D. cæruleocephala*, *L. conigera*, *L. comma*, *L. impura*, *L. pallens*, *C. lutosæ*, *A. putris*, *X. lithoxylea*, *X. monoglyphæ*, *N. saponaria*, *N. popularis*, *C. cytherea*, *L. testacea*, *M. brassicæ*, *M. persicariæ*, *A. basilinea*, *A. didyma*, *G. trilinea*, *C. morpheus*, *C. alsines*, *A. puta*, *A. suffusa*, *A. segetum*, *A. exclamationis*, *A. corticea*, *N. plecta*, *N. c-nigrum*, *N. xanthographa*, *T. ianthina*, *T. subsequa* (one), *T. orbona*, *T. pronuba*, *A. pyramidea*, *M. maura*, *P. rubricosa*, *T. gothica*, *T. instabilis*, *T. stabilis*, *Orthosia macilenta*, *A. litura*, *A. pistacina*, *A. lunosa*, *X. ferruginea*, *X. citrigo*, *X. flavago*, *X. fulvago*, *X. aurago*, *C. xerampelina*, *D. cucubali*, *H. serena*, *P. flavicincta*, *E. nigra* (one), *P. meticulosa*, *H. trifolii*, *H. oleracea*, *H. genistæ*, *X. lithoriza*, *C. umbratica*, *H. triplasia*, *P. chrysitis*, *P. gamma*, *P. iota*, *A. tragopogonis*, *C. nupta*.

Geometræ:—*M. sambucaria*, *R. cratægata*, *S. illunaria*, *C. elinguaris*, *E. tiliaria*, *E. angularia*, *E. erosaria*, *E. fuscantaria*, *A. pennaria*, *H. abruptaria*, *A. grossulariata*, *H. progemmaria*, *H. defoliaria*, *A. æscularia*, *C. brumata*, *O. dilutata*, *A. betularia*, *B. rhomboidaria*, *M. sociata*, *M. montanata*, *M. fluctuata*, *C. associata*, *C. pusaria*.—F. H. & G. E. PEACHELL; High Wycombe, Bucks, Dec. 30th, 1900.

NOTES FROM THE NORTH-WEST.—Again has the season been one of such considerable interest, if not of surprises, that I am tempted to continue a list of the more important observations, the last of which appeared in the 'Entomologist' for June (xxxiii. 182).

May.—Looking through my manuscript notes for the last ten years, I have been struck by the occurrence of a May storm about the middle of the month. The only exception worth notice was in 1892, when fine weather broke up, with rain and north-east winds, on the 3rd. Generally speaking, the trouble is one of cold, high winds with rain, and even snow—"winter lingering in the lap of May"—but, on three occasions—1895, 1898, and 1899—the storm was one of thunder and lightning. This year (1900) we had the cold week, with the wind north-east, about May 17th. As "the weather" is always a matter of moment to entomologists, these remarks may be of interest. The only other thing worth referring to under this month is a *Euchlōë cardamines*, which I saw flying along Eastgate Street, Chester, on the 20th.

June.—*Heliaca tenebrata* (*arbuti*) was plentiful on the hedge-banks this year; I took a dozen along a few yards, and in a few minutes, on the 4th. On the 1st I saw the dragonflies, *Ischnura elegans* and *Agrion puella*—just out—flying together. A delicate pink suffusion on the thorax, particularly in the case of *A. puella*, showed they were immature. *Enallagma cyathigerum*, *Libellula quadrimaculata*, and *Leucorrhinia dubia* appeared on the Delamere heaths, but also immature, on the 23rd. *Pyrrosoma nymphula* (= *Agrion minimum*) was well out on the 30th. A common beetle on the Delamere heaths, in June, is the handsome and variable *Cicindela campestris*. The night-feeding larvæ taken in Delamere Forest from sallow, birch and hawthorn, on April 28th (Entom. xxxiii. 182), began to appear on June 11th as perfect insects. Among them were six or eight *Aplecta nebulosa*, including three black forms. The Delamere type is a much darker moth than the one I come across in North Wales—say, in the county of Merioneth. That from Delamere is about as dark as *A. occulta*, whilst the Merioneth one is about as pale as *Polia chi*. A new and successful experience in June was the searching for moths, with the aid of a lamp, on flowers, particularly those of the campions, and of hogweed (*Heracleum sphondylium*). I have a lively recollection of those quiet and beautiful June nights—all the world asleep—and the seas of great white scented trusses of flowers flecking the sides of the lanes and river embankment. We took no rarities from these hogweeds, but they were well worth working by anyone who wished to renew common species. Foremost among these, in abundance, were *Axylia putris*, *Noctua c-nigrum*, *N. festiva* (with endless varieties), *Agrotis segetum* (equally as variable—the females often with red margins), *A. exclamatoris* (with pale to almost black forms), *Triphæna pronuba* in all sorts of shades and patterns, the mottled variety of *Apamea gemina* (often taken for *Mamestra furva*), and, of course, the type and varieties of *Xylophasia rurea*. The best geometers, and there were plenty of them, were *Timandra amatoria*, *Emmelesia decolorata* and *Eupithecia castigata*, the last species being a new record for Chester. At campion flowers we took, amongst others, *Dianthæcia cucubali*, aglow with marginal purple band and yellow streak—alas! they fade. Other moths at campion flowers were *Plusia pulchrina* and *E. venosata*. One night, or rather morning (but this was in July), we strayed among some fields, on the way home, to visit a growth of marsh mallows. The flowers were closed, but seven larvæ (night-feeders) of *Eubolia ceruinata* were secured. From these I had five moths between the 19th and the end of September. A double surprise, this month, was the abundance of *Lycæna ægon* and *Zygæna filipendulæ* in the Delamere Forest district. The butterfly was out in hundreds on the 30th, but all males, and flying in company with

L. alexis. The dark marginal shading of the lower wings, in the Delamere form, is often replaced by seven black spots. These spots also appear in the females, and enclosed in crescents of orange-red, frequently repeated less distinctly on the margins of the upper wings; the orange-red is often entirely absent in this sex. All these marginal spots and crescents I found most pronounced in specimens obtained at Abersoch (Carnarvonshire). The females were abundant on the 19th of July; and it was an interesting sight to see them all asleep on the heather-tops, at Delamere, at five o'clock in the afternoon, both sexes, and in every case head downwards. Coming back to June 30th, I picked thirty-four cocoons of *Z. filipendulæ* from the heather, in the hope of getting the variety with the lower wings orange. Years ago, from a dozen or more larvæ taken a few miles from Chester, I reared a couple of examples of this orange form. I have never seen the variety since. From the thirty-four cocoons several of the moths appeared with the two apical spots on the upper wings confluent. From nineteen larvæ of *A. ashworthii* I had nine moths in June and July—a poor result! Mr. Gregson used to say the species would never become extinct, but, as far as my experience goes, it is decidedly becoming scarcer, either as larva or imago. Acting upon information, as our friends the police would say, I examined, accompanied by another brother of the net, on June 18th, the flowers of the goat's-beard on the Dee embankment for larvæ of *Hecatera serena*. We were too late; but scores upon scores of the flower-heads had been hollowed out, presumably by these caterpillars. At the electric lamps history repeated itself, but, throughout the whole season, not so liberally as in last year. We had not the continued high temperature of last year. I took a specimen of *Chariclea umbra* (*Heliothis marginata*) on the night of June 5th. Mr. A. O. Walker's record for the insect is—"Wallasey; New Ferry; generally scarce. Rhyl." On June 6th I captured a fine, fresh, but much belated *Tæniocampa gothica*. Some years ago I netted a *T. stabilis*, also in June. *Tephrosia crepuscularia* should be classed among late appearances, as the species was continuously seen in April, May, and June. Two fresh specimens, dark forms, we captured in Delamere Forest on June 9th.

July.—On the 19th we netted four worn specimens and one good example (the last a female) of *Cænonympha dorus* on a Delamere heath. Among dragonflies *Lestes sponsa* was more abundant than ever, *Æschna juncea* and *Sympetrum scoticum* were just out, and *L. dubia* was nearly over. On the 24th I was among the Denbighshire Lepidoptera. I particularize the date, as it was one of the hottest in the summer, and I shall probably never forget its pleasures. One of my experiences was standing on a limestone precipice. There was a very abrupt, but friendly, slope; for a perpendicular descent is calculated to disturb humanity. Wherever the *débris* had lodged was a wealth of flowers of all colours, and the butterflies came sailing up in dozens at a time to taste their sweets. Three times higher than the sycamore-trees below stood I, and yet I was tempted to descend to the flowery beds and net *Vanessa cardui*, *Satyrus semele*, *Lycæna astrarche* (*agestis*), and other butterflies. But discretion is the better part of valour. On the hilly slopes 'about, *Herbula cespitalis*, *Ennychia cingulata* (*cingulalis*), *Crambus inquinatellus*, and *Leioptilus osteodactylus* were common. *Mimæseoptilus bipunctidactyla* was abundant, in the middle of the month, about the Chester hedgerows. My best captures at the electric lamps were *Charocampa elpenor*, *A. nigricans* (not at all a common insect with us), *Melanthia bicolorata* (*rubiginata*), *Nephopteryx spissicella* = *roborella* (a

new, district record), and *Rodophæa consociella*. Out of thirteen larvæ of *Callimorpha hera* I had seven alive at the end of April, and four of these died. Three moths emerged on the 17th, 19th, and 20th of July. So much for keeping hibernating larvæ indoors! Few people are aware what a good beetle we have at Chester—the small cockchafer, *Melolontha solstitialis*; and it is plentiful, though local. I got twenty in half an hour or so on the evening of the 17th, and sent them off to a coleopterist who was without the species. It frequently comes to the electric lights.

August.—As in May, there is commonly a serious and general break in the weather during the first fortnight, usually about the 12th. On the 3rd a friend and I made an early start for the Wirral. Hardly had we got to work amongst the Lepidoptera, when a black and angry-looking cloud was seen coming rapidly over the horizon from the south-east: the storm-path here is usually from south-east to north-west, and *vice versa*. *Epinephele tithonus* was out in such gratifying numbers that we anticipated varieties; but they were flying heavily and evidently looking about for shelter. We were out in the open country, and it was too apparent that time only admitted of hurrying to the only available haven, a railway-bridge spanning a cutting. Just in time, and then came the thunder, lightning, waterspout and semi-darkness! We were in a state of siege for hours, for the storm was driven back again from the coast by a fierce Atlantic gale. This was the break-up of the weather, and entomology had to wait for quite a week. *Colias edusa* was first observed on the 17th. Weighing the evidence at hand, and trying to avoid anything undigested, I should say the subsequent numbers of the butterfly were not due to migration but to climatic and other circumstances favourable to the insects. I believe that they are with us always. Besides, the migratory theory is always exposed to the query, Where did they come from? *Luperina cespitis* appeared at the electric lamps on the 14th, and *Notodonta dromedarius* on the 17th. The last species had been continuously emerging from the chrysalis since the 1st of June, and I am therefore inclined to put the insect captured on the 17th down to a retarded emergence. On the same date I took at the lamps a fine fresh specimen of *Hydræcia petasitis*—new to Chester; and my friend Mr. Hargreaves (Mr. Cattermole), of the "Private Secretary" Company, captured an *Aplecta occulta*—also new to Chester—on the 28th. *Xanthia xerampelina* is worth mentioning, in August, as a moth not quite so scarce as in previous years. Amongst the beetles at the lamps was *Necrophorus ruspator*. The dragonfly *Æschna grandis* has been common as usual during the summer.

September.—I had found many species of larvæ so scarce during the season that I paid a visit to Delamere Forest on the 15th. Here the birch-feeders, at any rate, were well represented. Brilliantly coloured are many of them, and distinguished in appearance. *N. camolina* was very common, including the rose-coloured variety. The same observation applies to *N. dromedarius*; its red form, with the tips of the humps a flaming crimson, is indeed a handsome caterpillar. *Dasychira pudibunda* was also beaten from the birches: where is there a handsomer caterpillar, with its delicate birch-green, its velvet-black segmental divisions, its four pale straw-coloured, brush-like tufts or ornaments, its radiating groups of golden hairs, and anal plume of maroon or purple? There were examples in plenty of a whitish or very pale green larva, almost white below, with legs and claspers of the same tint. The dorsal surface was a dark olive-green, the head light reddish, and there was a shining black shield on the

second segment. It reminded me of *Asphalia flavicornis*, and I fancy it will turn out to be *Cymatophora duplaris*. Larvæ of the odd-shaped *Drepana falcatoria* were numerous, clad in apple-green with a chocolate dorsal mantle. Some great, brown, sooty-looking fellows, with little regard for their personal appearance in the way of ornament, occasionally dropped into the umbrella. I put them down as *Amphidasys betularia*, but many species of caterpillars vary very much. Amongst hibernating larvæ were *Porthesia similis* = *Liparis auriflua* (they spin a little cocoon for their winter covering), *Geometra papilionaria*, and *Bombyx rubi*. The last were ceaselessly travelling, as usual at this time of the year, and I let them go on in search of their resting-places. *G. papilionaria* are now (Nov. 12th) resting nearly upright on their anal claspers, at an angle of about 30°, upon birch twigs, for all the world like twiglets or birch buds. This may be an attitude of protective resemblance against birds, but it certainly fails against ichneumons. Another visit to the forest on the 29th found all these species still present, though in diminished numbers, except *G. papilionaria*. They had evidently left the terminal twigs from which I had beaten them on the 15th. Ragwort flowers produced, on this occasion, two species of *Eupithecia* caterpillars: (1) delicate, reddish brown, with six paler, oblique marks on each side, and four darker, reddish-brown diamonds dorsally; (2) pale yellow, with varieties pale green and pale brown; five halberd-shaped, brown arrowheads dorsally, pointing towards the head. Female guats or mosquitoes—for a guat is a mosquito either under the microscope or by its life-habits—were almost insufferable during this visit. It is the female alone which “stings,” for she alone possesses the five lancets hidden away in the long sucker or proboscis; and it is the female only which emits the sharp, well-known cry, from what I believe to be musical spiracles. On July 19th, my friend and I were among myriads of males flying in and out among each other, and low over the heather, as in a vast quadrille. There was not a sound from them, and there was never a “bite”! Seen under a lens the mosquito is a beautiful insect. One cannot help admiring its pale ashy grey, relieved by six broad equidistant black bars, the fourth being the widest. The two wings, with their delicate fringes, are a study in themselves, and the feathered antennæ of the males compel one’s admiration. The female antennæ appear simple, except under the microscope. I captured a fine specimen of the dragonfly *Sympetrum striolatum* (= *Libellula vulgata*) in the forest on this date. *Æ. cyanea* was taken close to Chester, and brought to me on the 22nd. Near the city, on the 9th, I saw a remarkable form of the butterfly *Pararge megæra*, but failed to capture it. It had a broad median black patch or bar, one-third the width of the upper wing, and stretching from the base to half the length of each primary. The extraordinary moths taken at the electric lights in September were *Nonagrius lutosus* and *Xanthia gilvago*, both new to Chester. The second broods of *P. festuæ* and *N. c-nigrum* appeared about the middle of the month.

October.—The only capture worth alluding to was the water-beetle *Dytiscus punctulatus* and a female *Eugonia* (*Ennomos*) *fuscantaria*, both of which I took at the electric lights. The moth laid a number of fertile eggs.

November 2nd.—The season closed with *P. gamma* before the curtain.

I should mention that four beautifully fresh male specimens of *Zeuzera pyrina* (*æsculi*) and one example of *Gnophria quadra*, both species new to the district, were taken at the electric lamps here, but not by myself.—J. ARKLE; 2, George Street, Chester.

NOTES ON THE SEASON.—The season of 1900 has undoubtedly been a remarkable one in many ways. Among other things, the abundance of *Lycæna argiolus* and *Colias hyale* was very marked. At Lee several insects turned up which I have not taken there before, and others which had disappeared during the last few years. In June a few larvæ of *Leucoma salicis* were taken, and the imago appeared at light in July. In July, among other things, *Macroglossa stellatarum*, which I have never seen here before, was taken in the garden, and thirteen larvæ were found on a small patch of *Galium verum* about one square yard in extent. *Zeuzera asculi* (Catford), *Cossus ligniperda*, *Nola cuculatella*, *Abrostola triplasia* (fairly common—I had not noticed it for the last two seasons, though formerly abundant), and a single very fine and large *Scotosia dubitata*, which is curious, as there is no buckthorn very near here, and I have failed to feed the larva on any other food-plant. A fine pair of *Amphidasys betularia* was taken. Larvæ of *Cucullia chamomillæ* were present in a large chamomile field, but some very hard work with Mr. R. L. Hewitt only produced two larvæ, both of which fell to his sweep-net. It was a blazing hot day, and my share of the spoils was a huge collection of chamomile seeds down my back. In August the following were among the principal Lee captures:—Larvæ of *A. betularia* and *Ennomos fuscantaria* (Catford); imagines: *Hepialus sylvinus*, *Agrotis suffusa*, *A. nigricans*, *A. puta*, *Hydræcia nictitans*, *Cerigo matura*, *Noctua plecta*, *N. c-nigrum*, *Tethea subtusa*, *Pyralis costalis*, *Endotricha flammealis*, and *Cataclysta lemnata*. In September *Colius edusa* was seen at Blackheath, and reported from Hither Green. *Agrotis suffusa*, *Noctua c-nigrum*, *Anchocelis litura*, *A. lunosa*, *Ennomos tiliaria*, *E. fuscantaria*, and *Anaitis plagiata* were taken. In October *Hydræcia micacea*, *Anchocelis pistacina*, *Hypena rostralis*, *Himera pennaria*, and *Oporabia dilutata* were noticed; and in November *Himera pennaria*, *Hybernia defoliaria*, *Oporabia dilutata*, and *Cheimatobia brumata*. A good many of the above species I have never taken here before, though I have been collecting here for some years past. *Mania maura* and *Catocala nupta* were both common, as usual, but I missed *Nania typica* this year.

Our first visit of the season was, as usual, paid to Bexley, on February 24th; the result of a short search on tree-trunks being a male *Phigalia pedaria* and a goodly number of *Hybernia leucophæaria*, including one female; the males were, as usual, variable. The following day my father (Mr. F. B. Carr) and I paid a second visit to the same locality, taking several more male *H. leucophæaria* and one female, also another *P. pedaria*; and on the new fences on Darford Heath *Anisopteryx æscularia*, *Hybernia progemmaria*, and *H. rupicaprararia*.

A walk to Mottingham and Chislehurst on April 1st was only productive of *H. progemmaria* and *Diurnea fugella*; and a visit to Addington on the 7th produced *A. æscularia*, *H. progemmaria*, and larvæ, from oak-stumps, of *Sesia asiliformis* (*cynipiformis*), for which larvæ we revisited the same spot the next day, and took *Asphalia flavicornis* as well.

A visit to Bexley on April 21st was on one of those most delightful spring days which we so seldom get. *Pieris rapæ* and *Lycæna argiolus*, *Tanioscampa cruda*, *Vanessa urticæ*, and *Diurnea fugella* were noted. On the 29th a few hours were spent at Bexley. One *Xylocampa lithorhiza* was the only imago seen, but the following larvæ were taken:—*Nola cuculatella*, *Xanthia cerago* (from which one var. *flavescens* was bred), *Miselia oxyacanthæ*, *Rumia luteolata*, *Hemithea thymiaria*, and *Cheimatobia bru-*

mata. The afternoon of May 5th I spent by myself at Oxshott. Males of *Saturnia carpini* were flying furiously over the heath, but all attempts to catch them were unsuccessful. *Anarta myrtili*, *Eupithecia nanata* (very abundant), and *Fidonia atomaria* were also about; also larvæ of *Xanthia cerugo* and *Thera variata*. A week later Oxshott was again visited, but it was horribly cold, and the following insects were noticed:—*Eupithecia nanata*, *Fidonia atomaria*, and single specimens of *Drepana lacertinaria*, and *Zonosoma (Ephyra) pendularia*. A very bad specimen of *Agrotis puta* was found at rest near the station. Larvæ taken were *Agrotis agathina* (five), *Metrocampa margaritaria*, *Oporabia dilutata*, and *Cheimatobia brumata*. With regard to larvæ of *A. agathina*, both in the New Forest and at Oxshott I have taken them by sweeping the heath under pine-trees, and not right out in the open. We managed to feed them up on plum, which should prove a useful substitute.

A walk to Chislehurst with my father the next day (May 13th), produced *Xylocampa lithorhiza*, *Ligdia adustata*, and a very fine *Anticlea badiata*, with larvæ of *Cleoceris viminalis*, *Orthosia lota*, &c. On May 20th a short time at Bexley produced *Lycæna argiolus* and *Pieris rapæ*, and larvæ of *Thecla quercus*, *Cleoceris viminalis*, *Orthosia lota*, &c. Six days later the same locality produced *Argynnis (Brenthis) euphrosyne*, *Drepana falcataria*, *Tephrosia luridata (extersaria)*, *Zonosoma porata*, *Cubera pusaria*, *Asthena candidata*, and *Melanippe montanata*, and larvæ of *Hybernia aurantiaria* and *Oporabia dilutata*. May 27th, at Bexley, produced *Pieris rapæ*, *P. napi*, *Euchloë cardamines*, *Vanessa io*, *Lycæna argiolus*, *Rumia luteolata*, *Venilia maculata*, *Tephrosia punctulata*, *Ligdia adustata*, *Panagra petrararia*, *Zonosoma punctaria*, *Melanthia ocellata*, and larvæ of *Hylophila bicolorana*, *Phigalia pedaria*, *Hybernia defoliaria*, *Calymnia (Cosmia) trapezina*, &c.

The afternoon of June 16th was spent with the South London Entomological Society at Chipstead and Banstead. *Lycæna icarus*, *L. agestis*, *Cænonympha pamphilus*, *Smerinthus tilia*, *Bapta temerata*, *B. taminata*, *Eupithecia centaureata*, and larvæ of *Scotosia dubitata* and *Tæniocampa gracilis* falling to my lot. The same day my father took *Tephrosia punctulata* and *Cubera pusaria* with larvæ of *Bombyx neustria* and *Tæniocampa stabilis*, at St. Paul's Cray.

A short time spent at the much-worked Bexley on June 17th and 18th produced the three common Pierids, *Vanessa atalanta*, *Cænonympha pamphilus*, *Hesperia sylvanus*, *Halius prasinana*, *Acronycta aceris*, *Hadena dentina*, *Zanclognatha grisealis*, *Tephrosia punctulata*, *Iodis lactearia*, *Cubera pusaria*, *Asthena candidata*, *Acidalia bisetata*, *A. remutaria*, *Zonosoma punctaria*, *Z. porata*, *Panagra petrararia*, *Camptogramma bilineata*, *Melanippe montanata*, *M. subtristata*, and *Coremia unidentaria* (?).

On July 6th I walked to the Crown Woods, Eltham, and noticed on palings and tree-trunks *Acronycta aceris*, *A. psi*, *Hecatera serena*, *Aplecta nebulosa* (rather dark), *Boarmia repandata*, and *Acidalia aversata*, whilst *Epinephele ianira* flitted about the hedges, despite a thunderstorm. On the 8th my father took *Phorodesma bajularia*, and larvæ of *Ligdia adustata* at Bexley. On the 9th a walk to Mottingham produced, among other things, *Cucullia umbratica*.

July 11th, a very hot, fine day, was spent at Oxshott. *Vanessa atalanta* was seen. *Epinephele ianira*, *Cænonympha pamphilus*, and *Hesperia sylvanus* were all very common, but *Lycæna ægon* was quite fresh, and only males were netted. *Macroglossa stellatarum* was observed hovering about

the sides of the sand-pit. A few *Euthemonia russula* were taken, including one female, which obliged us with fertile ova. *Drepana falcataria* (worn), *Agrotis porphyrea* (worn), *Xylophasia polyodon*, *Plusia gamma* (worn), *Erastria fuscula* (*fasciana*), *Uropteryx sambucaria*, *Ellopiæ fasciaria* (*prosapiaria*), *Geometra papilionaria* (a grand male, beaten from birch), *Fidonia piniaria* (one male, females common), *Cabera pusaria* (very abundant), *Melanthia ocellata*, *Melanippe subtristata*, *Lomaspilis marginata*, *Acidalia aversata*, *Thera variata*, and *Macaria liturata* complete the list of imagines. *Tæniocampa stabilis*, *Trachea piniperda*, *Anisopteryx æscularia*, and *Zonosoma punctaria* were the only larvæ noticed.

On July 14th a full day was spent in the company of Messrs. F. Enock and W. J. Lucas at the Black Pond, Esher. On the way to the pond from Claygate Station the following species were noted:—*Epinephele ianira*, *Cænonympha pamphilus*, *Lycæna ægon*, *Hesperia sylvanus*, *Calligenia miniata*, *Erastria fuscula* (*fasciana*), *Ellopiæ prosapiaria*, *Fidonia piniaria*, *Cabera pusaria*, and *Acidalia aversata*. Arrived at the Black Pond, *Anax imperator* occupied most of our time, but, though fairly common, one only was taken. *Pyrrhosoma tenellum* was common, but only a few *P. nymphula* were seen. *Enallagma cyathigerum* was another common dragonfly, and one *Æschna grandis* was observed. *Libellula quadrimaculata* was not uncommon, and I had the pleasure of taking var. *prænumila* (Newm.). *Calligenia miniata*, *Agrotis porphyrea*, and a larva of *Trachea piniperda* were taken. After the usual tea at Oxshott, we walked back to Claygate, putting in some very successful dusking on the way. *Hepialus hectus* was common, and *Calligenia miniata*, *Angerona prunaria* (males), and *Melanthia rubiginata* fairly so. Three male *Phorodesma bajularia* were netted, but only one was worth keeping. One *Acidalia emarginata* was taken. *Cidaria fulvata* was fairly common, whilst *Hemithea thymiaria* was very abundant. A single specimen of *Hypena proboscidalis* was seen. The best catch of the day, however, was a specimen of *Calymnia* (*Cosmia*) *pyralina*, which had freshly emerged, and had not spread its wings when taken, but afterwards developed into a fine specimen. With Claygate now before us, nets were put away, and a most successful day came to an end.

The evening of July 18th was spent with Mr. R. L. Hewitt at Bexley. There was very little about. As at Oxshott, *Melanthia rubiginata* flew in large numbers at dusk. *Calligenia miniata*, *Triphæna pronuba*, *Hemithea thymiaria*, *Cabera pusaria*, *C. xanthemata*, *Acidalia aversata*, *A. osseata*, *A. bisetata*, *Lomaspilis marginata*, *Larentia didymata*, and *Endotricha flammealis* (very abundant) were also noticed. Treacle was a failure; but, while waiting for our train at Bexley Station, *Leucoma salicis*, *Nola cucullatella*, *Axylia putris*, *Hecatera serena*, *Caradrina morpheus*, *Xylophasia polyodon*, and *Eupithecia subnotata* were boxed off the lamps in about ten minutes, making one wish that one were manipulating a light in the fens.

Thanks to the invitation of a friend, a very jolly week-end (July 21st to 23rd) was spent at the picturesque village of Westcott, near Dorking. The weather was grand. *Pieris brassicæ*, *Epinephele ianira* (very abundant), *E. tithonus*, *E. hyperanthus*, *Cænonympha pamphilus*, *Vanessa urticæ*, *V. polychloros* (about half a dozen, and a pupa, found on a wall—the imago emerged the same day), *Lycæna argiolus* and *Hesperia thaumas* were all the butterflies noticed. Of the moths, two examples of *Macroglossa stellatarum* and a few *Zygæna filipendulæ* were seen. A beautiful specimen of *Zonosoma omicronaria* was taken, and two *Melanippe procellata* were

knocked out of the clematis at the foot of the chalk hills. *Eubolia bipunctaria* was in countless hundreds on the chalk slopes, and *E. mensuraria* was common in the sheltered hollows. *Uropteryx sambucaria*, *Metrocampa margaritaria*, *Acidalia aversata*, *A. osseata*, *A. trigeminata*, *Cabera pusaria*, *Larentia didymata* (very abundant). *Hypsipetes elutata* (swarming), &c., were also beaten out. In the hope of breeding some of the *Dianthoscias*, I picked a bagful of campion capsules, and found a few larvæ of *Eupithecia venosata* among them. Dusking produced swarms of *Larentia didymata*, which were flying over the bilberry; *Acidalia imitaria*, *A. aversata*, *Leucania lithargyria*, *Xylophasia lithoxylea*, and *Botys ruralis*; whilst single examples of *Apamea ophiogramma*, *Acidalia imitaria*, and *Botys farinalis* came indoors to light. *Bryophila perla* was found on walls in Dorking.

My next excursion was to Horsley, with Mr. S. W. Kemp. Several rather worn *Argynnis aglaia* were seen, and one *A. adippe*. *Pieris brassicæ*, *P. rapæ*, *P. napi*, *Epinephele ianira*, *E. hyperanthus* (worn) *Cænonympha pamphilus*, *Lycæna corydon* (very abundant), *L. icarus*, *Polyommatus phlæas*, *Hesperia sylvanus*, *H. thaumas*, and a few very fresh *H. comma* complete the list of butterflies. Very few moths were seen: *Macroglossa stellatarum*, *Porthesia similis*, *Drepana unguicula*, *Bryophila perla*, *Plusia gamma*, *Toxocampa pastinum* (one), *Phytometra ænea* (worn), *Acidalia aversata*, *Eubolia bipunctaria* and *E. mensuraria* (both very abundant) were the only species. The day was spoilt by a heavy thunder-storm.

August 1st was spent at Byfleet, with Mr. H. J. Turner and my father. Here, again, we were fairly drenched, but the rain ceased about 1.30, and did not begin again till six. A single male *Gonepteryx rhamni* and five other more or less common species of butterflies were seen. *Lithosia griseola* was common alongside the canal, and three specimens of var. *stramineola* were boxed, and another seen. *Porthesia similis*, *Uropteryx sambucaria*, *Zonosoma punctaria* (common and fresh), *Z. porata*, *Z. pendularia*, *Eupisteria heparata*, *Cabera pusaria*, *Lomaspilis marginata*, *Acidalia emarginata*, *Eubolia mensuraria*, *E. palumbaria*, *Fidonia atomaria*, *Ennomos angularia*, *Botys ruralis*, *Ebulea crocealis*, and *Hydrocampa nympeata* were also noticed. The following larvæ were taken, among others: *Gonepteryx rhamni*, *Notodonta dromedarius*, *Spilosoma mendica*, and *Acronycta leporina* (two from alder and one from birch). The wet weather was too much for the dragonflies, and the following species only were noticed: *Erythromma naia*s, *Ischnura elegans* (very abundant), *Platycnemis pennipes*, and *Enallagma cyathigerum*.

August 14th, at West Wickham, produced *Hepialus hectus* (one), *Calymnia trapezina* (common), *Plusia gamma* (swarming), *Ennomos erosaria* (?), *Timandra anataria*, *Pelurga comitata*, *Zonosoma punctaria*, *Z. porata*, *Botys ruralis*, and *Endotricha flammealis*.

August 16th, a very enjoyable day was spent with Mr. F. Enock at Ockham Pond and Wisley Lake, mainly for Odonata. The following species were noticed:—*Sympetrum scoticum* (very common), *S. sanguineum* (a few), *S. striolatum* (very common), *Æschna grandis* (common, but difficult to catch), *A. cyanea* (?), *Lestes sponsa*, *Ischnura vlegans*, and *Enallagma cyathigerum*. Lepidoptera noticed were:—*Vanessa cardui*, *Gonepteryx rhamni*, the common Pierids, *Epinephele ianira*, *E. tithonus*, *Pararge megæra*, *Cænonympha pamphilus*, *Lycæna icarus*, *L. argiolus*, *Polyommatus phlæas*, *Plusia gamma*, and *Hydræcia nictitans*, and larvæ of

Smerinthus ocellatus, *Drepana falcatoria*, and *Gonoptera libatrix* (also a pupa spun up in some sallow leaves).

My father and I spent August 22nd at Loughton, taking, among other things, *Thecla betulæ* (a perfectly fresh male), *Ennomos angularia*, *E. tiliaria*, *Hydrocampa nympheata*, and *Paraponyx stratiolata*. Larvæ of *Orgyia pudibunda* and *Demas coryli* (two) were beaten from beech. Among the dragonflies *Æschna grandis* was common, and so were some greenish *Æschnas*, whose species it was impossible to tell on the wing. One *Æschna mixta* was taken. *Sympetrum striolatum* was common, and *Ischnura elegans* and *Enallagma cyathigerum* were also noticed.

The evening of the same day was spent at Bexley, where treacle produced *Miana furuncula*, *Xylophasia polyodon*, *Mamestra brassicæ* (very common), *Agrotis suffusa*, *A. puta*, *Noctua xanthographa* (common), *N. c-nigrum*, *N. stigmatica*, *N. baia* (worn), *Triphæna pronuba* (very common), *T. orbona*, *Amphipyra pyramidea* (worn), *A. tragopogonis*, *Hadena chenopodii*, *Phlogophora meticulosa*, *Cosmia trapezina*, *C. diffinis* (one, quite fresh), *Catocala nupta*, *Endotricha flammealis* (v. worn), and *Pyralis costalis*; whilst ragwort only attracted *Noctua xanthographa*, *N. stigmatica*, *Camptogramma bilineata*, and *Botys ruralis*.

August 31st was spent at Chelsfield and Shoreham, Kent. *Gonopteryx rhamni* was abundant. Only one *Colias edusa* was seen, but seven *C. hyale*. *Vanessa atalanta*, *V. io*, *V. urticæ* (abundant), *Epinephele ianira* (abundant), *Cænonympha pamphilus*, *Satyrus semele*, *Lycæna icarus*, *L. argiolus*, and one *Hesperia comma* were seen. *Hypena rostralis* was abundant; and, among other things, *Minoa euphorbiata*, *Acidalia inornata*, and *Anaitis plagiata* were taken. The specimen of *M. euphorbiata* was netted in the same place where we took the species in 1898. About eight small larvæ of *Acronycta ligustri* were beaten from ash. They fed up well on privet.

On September 7th a day's collecting was enjoyed with a friend at Birchington-on-Sea. We succeeded in taking fifteen *Colias hyale* between us, and saw many more. Only one *C. edusa* was seen. I may mention that, among other common butterflies, *Pieris rapæ* simply swarmed; one of the clover fields seemed alive with them. A fresh brood of *Strenia clathrata* was coming out, and, among other things, *Aspilates citraria*, *Hydrocampa nympheata*, and *Cataclysta lemnata* were taken. Very little attention was given to the Odonata, as the primary object was *C. hyale*. *Sympetrum striolatum*, *Ischnura elegans*, and *Lestes sponsa* were noticed.

Treacling at Paul's Cray Common, on September 10th, produced *Mamestra brassicæ* (common), *Amphipyra pyramidea* (common), *Phlogophora meticulosa*, *Catocala nupta*, *Hadena protea*, *Anchocelis litura*, and *Xanthia ferruginea*.

September 11th, at Brasted, practically wound up the season, as far as I was concerned. *Cidaria immanata*, *Xanthia cerago*, and a battered *Colias hyale* were the only species worth mentioning.

On the whole, I think that many will look back on the year 1900 with pleasant memories of its productiveness, and I am sure I shall be one of the number.—F. M. B. CARR; 46, Handen Road, Lee, S.E., November 18th, 1900.

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BIOLOGIC NOTES ON SOME CEYLONESE RHYNCHOTA.

No. 1.

By E. E. GREEN, F.E.S.

AMORGIUS INDICUS (Lep. & Serv.) [=BELOSTOMA, *olim.*]

This huge waterbug is frequently captured in Kandy beneath the electric lamps which have been recently erected in the streets. They probably fly from the lake in the centre of the town. I have had several living specimens brought to me, and have kept some of them in a large glass aquarium for several months. They are sluggish creatures, and remain during the daytime with the tip of the tail projecting above the surface of the water, seldom moving, unless disturbed. I placed some small fish and tadpoles in the aquarium with them. I could never see any attempt on the part of the bugs to capture either of these animals. The fish have remained unhurt, but the tadpoles have disappeared one by one, seized probably during the night, when the bugs are more active. I do not think that *Amorgius* is quick enough in its movements to prey regularly upon fish, though doubtless weakly individuals would fall easy victims. I am of opinion that the natural food of *Amorgius* is rather such large insects or small terrestrial animals as fall accidentally into the water. It will also greedily feed upon frogs, when it can catch them. I have on several occasions placed large horny beetles, such as *Oryctes*, in the water. These have been quickly seized while struggling on the surface. They are held by the powerful front legs of the bug, assisted by the second pair, and are turned over and over until a crevice is found into which the point of the rostrum can be inserted. After they are quite dead the insects are usually torn into pieces and every part of the body thoroughly probed. Large grasshoppers are also freely taken, but smaller insects are generally

ignored. A good-sized water-beetle (*Dytiscus* sp.) shared the aquarium for about a week before it fell a victim.

Every fresh example of *Amorgius* that I have examined has been infested by a peculiar elongate parasitic Acarid, which attaches itself in clusters to various parts of the body and limbs of its host.

On October 26th I observed two egg-clusters at the bottom of the aquarium, presumably deposited by the *Amorgius*. The smaller cluster contained nine eggs; the larger cluster over fifty.



AMORGIVS INDICUS —Fig. 1. Egg-cluster, nat. size.
Fig. 2. Single egg $\times 4\frac{1}{2}$ diam.

They were somewhat in the form of a bunch of grapes (fig. 1), the eggs cohering together by some fibro-gelatinous matter, the clusters, unattached to any object, lying loosely on the earth at the bottom of the vessel. Each egg is pyriform, 5.50×3 mm., the larger end outwards, and slightly flattened on one side (fig. 2). They are of a pale greenish yellow colour, with alternate opaque and translucent lines radiating from the centre of the larger extremity, and extending about one-third the length of the egg, except on the flattened area. These eggs were removed to a smaller aquarium with growing plants, but became discoloured after a few days, and are apparently dead. Possibly they were unfertilized.* Another batch of eggs was deposited on the 6th November, which have been left to take their chance in the larger aquarium. To prevent the escape of the adult insects the vessel is covered with perforated zinc.

Since writing the above, I have detected one of the bugs in the act of feeding upon its own eggs. It was holding the egg-cluster in its front legs and probing the separate eggs, one after another.

DISPHINCTUS FORMOSUS, Kirkaldy.

This species is, just now, abundant on plants of *Cuphea jorullensis* in the Botanic Gardens. The young shoots are badly punctured and wilted, and the plants completely disfigured, the damage being done chiefly by the immature insects. The adults

* For an account of the ova of the allied American *Benacus grisea* (Say) and *Amorgius impressa* (Haldem.) [= *americana*, auctt.] see C. M. Weed in Bull. Ohio, Agricult. Exper. Sta., Technic. Series, vol. i. pp. 14-17, Pl. ii. figs. 6 and 7 (1889).—G. W. K.

are difficult to find and, being very active on the wing, make their escape as soon as the plant is disturbed. I was fortunate in capturing one pair *in coitu*, and confined them in a glass jar with some young shoots of the plant. A few days later I found several eggs embedded in the fleshy stalks. They are deposited singly, the body of the egg completely concealed (fig. 4), the



DISPHINCTUS FORMOSUS, Kirkaldy.—Fig. 3. Egg in section $\times 20$ diam.
Fig. 4, showing part of egg exposed.

position marked—as with the eggs of *Helopeltis**—by a pair of delicate, glassy, horn-like processes. The complete egg (fig. 3) might easily be mistaken for that of *Helipeltis*, the principal difference being that the two processes are usually divergent instead of convergent. The longer process has a knee-like bend shortly above the base. The cap of the egg is delicately pitted. The body of the egg is smooth, curved, elongate, of a pale creamy white colour. Length, 1.50 mm. Breadth, 0.25 mm. Longer process, 0.50 mm. Shorter process, 0.20 mm.

ANOPLOCNEMIS PHASIANUS (Fabr.).

Both the adult and immature insects occur frequently on the young shoots of *Erythrina lithosperma*. They puncture the extremities of the shoots, causing them to wilt and wither. I noticed, one day, an adult male apparently feeding, and approached it to observe the *modus operandi*. The bug, however, resented the intrusion, and ejected a jet of fluid backwards to a distance of fully eighteen inches. The jet appeared to proceed “*ab ano*.”

N.B.—Mr. Albert D. Michael has kindly examined the parasites mentioned above as being found on *Amorgius indica*, and determines them provisionally as larvæ of *Hydrachna belostomæ*, Riley (adult *Hydrachnæ* are not parasitic). In reply to my note, pointing out that the American *Amorgius* is a different species from the Sinhalese one, and asking whether the parasite of the former is actually conspecific

* Compare Dudgeon's account of the oviposition of *Helopeltis theivora*, Waterh. and *Disphinctus dudgeoni*, Kirkaldy (1894, Ind. Mus. Notes iii. (5), pp. 33–8; 3 figs.); also Sharp, 1899, Cambridge Nat. Hist. vi. pp. 561–2 (Sharp incorrectly cites “Dudgeon, p. 53”).—G. W. K.

with that of the latter, Mr. Michael writes me: "Riley was not an acarologist, and his descriptions and drawings of Acari cannot ever be relied on for small differences between closely allied species. Your specimens naturally had not any adult *Hydrachna* on it, but so far as I could judge from Riley's drawings and very imperfect descriptions of the larva, it seems to agree well in all its stages with your specimens. The water-mites, when parasitic, do not usually confine themselves to a single host, but are often found on several species; and the geographical distribution of Acari is usually very wide, often astonishingly so. Riley says that his species is particularly common on *Zaitha fluminea* (Say)* = *Perthostoma aurantiaca*, Leidy" (in litt. 29 Jan. 1901).

G. W. K.

MISCELLANEA RHYNCHOTALIA.

By G. W. KIRKALDY, F.E.S.

Fam. *Miridæ*.

AUSTROCAPSUS, gen. nov.

Belonging to *Capsuria*, Reut., and allied to *Hyalopeplus*, Stål.

Head subtriangular, wider with eyes than the anterior margin of pronotum; tylus broad, declivous; interior margin of eyes sub-sinuately convex; first segment of antennæ stout, its length equalling that of the median line of the head from base of the head to base of tylus. Pronotum distinctly collared, the collar anteriorly straight, posteriorly somewhat deeply (comparatively) convex. Pronotum raised posteriorly, anteriorly callous on each side behind the collar, very rugose transversely, widely somewhat sinuately rounded posteriorly, lateral margins subsinuate. Scutellum transversely impressed near the base. Interior cell of membrane very large.

The other characters are those of the division as signalized by Reuter in the fifth volume of the 'Hemiptera Gymnocerata Europæ.'

Type A. MARTIGENA, sp. nov.,

Head yellowish; two thin median longitudinal lines from which branch off obliquely six or seven lines on each side, first segment of antennæ blood-red; eyes dark blood-red. Pronotum and scutellum yellowish, very closely rugose and marked with blood-red. Elytra (including membranal nervures), abdomen above, and beneath, blood-red. Wings and membrane infusate. Head beneath, sterna and femora yellowish with bright blood-red subparallel sinuate lines.

Though the ground colour is really yellowish, it is so closely marked with blood-red that the general effect is that of the latter colour. The pubescence is scanty, and is pale golden yellow. Length 6½ mill.

WEST AUSTRALIA, Perth (my collection).

* Now known as *Belostoma fluminea*, Say.

* Fam. *Gerridæ*.2. *GERRIS ANADYOMENE*, sp. nov.

Belongs to subgenus *Limnometra*; Mayr.

Flavous; head with an irregular diamond and two lateral stripes, pronotum with a median and two sublateral lines, irregular markings on ambulacra, &c., black. Elytra dark greyish fulvous; nervures fulvous, apically, darker. Spines of seventh segment extending beyond apex of abdomen, elytra extending far beyond apex of abdomen. Male: seventh segment deeply, roundly emarginate ventrally. Long. to apex of elytra 14 mill.

CEYLON, Pundaluoya. Collns. E. E. Green and Kirkaldy.

Larger and stouter than *minuta* (Mayr.), to which it is somewhat allied.

3. *GERRIS SAKUNTALA*, sp. n.

Belongs to subgenus *Limnometra*, Mayr.

Black, closely set with pale golden pubescence; a central line on head and anterior lobe of pronotum, lateral margins of posterior lobe, antennæ, legs. &c., fulvous. Elytra infusate, nervures pale golden, pubescent. Venter pale flavous, Elytra extending far beyond apex of abdomen. Long. $5\frac{1}{2}$ mill.

CEYLON, Pundaluoya (collns. E. E. Green and Kirkaldy).

This lovely little *Gerris* is quite distinct in colouring from any other *Limnometra*, and is specially distinguished by the entire absence of any connexival spines.

THE STUDY OF LIFE-HISTORY.

(Concluded from p. 97.)

In studying the habits of living insects instead of too closely confining our observations to captive specimens, we should, when practicable, contrive to give at the same time constant attention to the same species existing in a state of nature; for the circumstance must never be overlooked, that it matters not how cunningly we may endeavour to conceal the fact, nor how diligently we may attend to food supply and other details, our types are nevertheless living under purely artificial conditions. Captive insects will teach us much, and will more often than not prove the source from whence most of our information is gleaned, but we should still regard them more in the light of qualified teachers or guides whose principal usefulness lies in the furnishing us with valuable hints and data upon which to base and work out our study of their species in the open, rather than as the sole origin from which our knowledge is to be derived. It is in all probability

* These species will be treated more fully and figured in another place.

the neglect of this combination of observation which has contributed in no small degree to some of the curious errors so often met with in accounts of the life-histories of even our commonest insects; such as, for instance, in the egg-laying of the *Dytisci*, a genus of carnivorous water beetles, where, in many text-books, you will find it definitely stated that the female extrudes her eggs at random in the water. This assertion was founded in the first place on the experience of Lyonnet, whose captive beetles thus oviposited, as pent-up insects are wont to do; whereas under natural conditions the eggs in this genus are really deposited singly and with circumspection in the submerged portions of various rushes, pond-weed, and other aquatic plants, and for the careful placing of which the ovipositors of the females are provided with two sharply-edged plates, one on either side of the oviduct, with which incisions are made in the submersed stems to receive them. This tendency to promiscuous oviposition during captivity I have often noted in connection with *Dytiscus punctulatus*, *Gastroidea viridulus*, and other insects.

Whilst speaking of the *Dytisci*, I will here call attention to one or two of the simpler problems awaiting solution, to which I just now alluded. Those of us who have kept *Dytiscus punctulatus* or *D. marginalis* alive for any length of time will have become cognisant of the fact that, in common with many other imagines and some few larvæ, they stridulate at times with great energy. This stridulation is produced in two distinct tones—the one harsh and shrill, the other a lower “trill” or buzzing sound. We shall moreover have probably remarked that such notes are almost invariably emitted towards nightfall or during the evening hours, and I am strongly inclined to the opinion that the *Dytisci*, like the *Gyrini*, or “whirligig” beetles, are in the habit of stridulating previous to flight; for, in so far as my own experience goes, these musical efforts are confined to the evening, during which period, too, the beetles fly. But the question to which I particularly wish to direct your attention is, by what mode are these sounds generated? The only definite statement I can find on the subject is by Prof. Miall, who says “the sound is produced by rubbing the under side of the wing-cases against the ends of the body”; but if these areas are examined stridulating organs are not readily perceptible. The fact that Mr. C. J. Gahan made no reference to the *Dytisci* in his exhaustive paper “On the Stridulating Organs in the Coleoptera,” read before the Entomological Society of London during the session just closed, prompted me to write him on the subject, with the result that he tells me he has never been able to detect the presence of stridulating organs in the genus. “Whether they make the sound in the manner described by Prof. Miall or not,” he proceeds, “I cannot, of course, say, but I am inclined to doubt his statement. There is nothing on the elytra or abdomen at all resembling the stridu-

lating areas of other beetles, nor is there on any other part of the body, so far as I could find. Since receiving your letter I have again examined a *Dytiscus* I had by me, but I have not been more successful than before. There is a series of short transverse ridges near the edge of the upper surface of the first abdominal segment in *Dytiscus*, but the ridges are very coarse, unlike any occurring on true stridulating areas of other beetles, and, so far as I can see, it is not possible for them to come into play against the elytra." I might add that Dr. Sharp, our greatest authority on the carnivorous water-beetles (*Dytiscidæ*), makes no mention of stridulating organs other than those of *Pelobius* (Camb. Nat. Hist.).

Since writing the above Mr. Gahan has been kind enough to again communicate with me on the matter, calling my attention to a paper entitled "*Die Tonapparate der Dytiscidæ*," by Hermann Reeker ('*Archiv für Naturgeschichte*,' 1891, vol. lvii. pp. 105, *et seq.*), in which he states that stridulation is produced in *Dytiscus*, *Pelobius*, and other members of the family by rubbing one of the large outer wing nervures against the elytra, the transverse ridges on these nervures being very prominent, and, according to Reeker, more numerous in the *Dytiscidæ* than in other beetles. But "many other beetles," writes Mr. Gahan, "which are not known to stridulate, or else are well known to do so in a different way, have the corresponding wing-nervure just as prominent and as strongly ribbed across; so that I am somewhat inclined to share Dr. Sharp's view that Reeker's explanation is erroneous. I certainly believe with Sharp that it is erroneous so far as it applies to *Pelobius*, but he may, of course, be right in regard to *Dytiscus*; and it would be well therefore to call attention to his explanation."

Here then is one of the enigmas awaiting solution by the diligent naturalist, and any young member here present who may be anxious to solve the mystery will meet with very little trouble in obtaining his beetles, have little time to wait ere hearing them stridulate, and experience little difficulty in obtaining permission to communicate in the form of a paper at an early meeting of the Society the successful results of his investigations.

Still confining ourselves to the same insect, we may further note that no satisfactory explanation has hitherto been advanced to account for the dimorphism exhibited by the females of this genus. Of our six British beetles, the females are dimorphic in four species. Camerano, probably quoting from Simmermacher, says that the sculptured females belong more particularly to northern districts; and the observations of Redtenbacher, who states that near Vienna the smooth form of female is as general as the rough, appears to support this assertion. But the fact, even if established, fails to furnish us with any clue as to either cause or purpose. In the allied terrestrial family of *Carabidæ*

the males as well as the females are usually rough, an event of rare occurrence in the Dytiscidæ; whilst in *Hydroides*, the closely allied genus which combines with *Dytiscus* to constitute the tribe Dytiscina, the females, although dimorphous, have almost invariably smooth elytra like the males. Early authors have generally associated the roughness of the females with the perpetuation of the species, and regarded the grooved elytra in *Dytiscus* as a special provision of Providence, and accessory to the suckers on the fore feet of the male beetles. But Plateau was the first of several naturalists whose experiments greatly tended to shake our faith in these earlier interpretations. The results of Plateau's investigations have been summarized by Miall, whilst the subsequent tests of Dr. Lowne formed the subject of a paper communicated to the Royal Microscopical Society in 1871. It will be sufficient for our purpose to-night to quote the former:—“(1) Furrows on the elytra diminish instead of increasing the holding power of suckers; ground glass and paper do not on trial act so well as polished glass. (2) The suckers of the male are not applied to the furrowed part of the elytra at all, but to the prothorax and the smooth edges of the elytra. (3) Females with smooth elytra occur now and then in England, and the male can hold these as well as the common form.”

The subject of dimorphism has, since the publication of Darwin's 'Origin of Species,' received a good deal of attention, more especially from botanists and lepidopterists. Sexual dimorphism is shown in some degree by a large portion of our British Lepidoptera, especially amongst the blue and hairstreak butterflies; and two forms of the same sex, as in *Dytiscus*, are not uncommon: thus in the clouded yellow (*Colias edusa*) one form of the female resembles the male, save that the broad dark border which runs round the wings in the latter sex is broken by yellow spots, whilst the other is of a more or less unicolorous creamy-yellow tint. Again, in the silver-washed fritillary (*Dryas paphia*), the female may be either dark brown or blackish green. Whether Mr. Tutt, Mr. Pierce, or other authority has successfully solved the reason for these persistent variations in the same sex amongst lepidopterous females, I am, I regret to say, insufficiently acquainted with that order of insects to state; but no convincing or satisfactory explanation has hitherto been advanced to account for the dimorphous females in *Dytiscus*, and I have therefore pleasure in further calling the attention of some of our more enthusiastic members to this interesting fact.

It is a far cry from the rotund and solidly constructed *Dytiscus* to the fragile form of *Chironomus plumosus*, the earlier life of which dipteron furnishes those of us who have microscopes with opportunity for very careful observation and minute research, for the problem here set us falls to the province of those who combine with the study of the living insect, pure and

simple, the allied interesting microscopic examination of its parts. Although perhaps unfamiliar by name, several species of *Chironomus* will be known to us by sight, the insects being often common about our window-panes within doors, or seen performing intricate gyrations in the air without. In appearance they closely resemble gnats, or mosquitoes as they are often called, the similitude being so marked that there is every excuse for our at first confounding the two. A rough and ready way of distinguishing between them is to watch the insects at rest, when it will be seen that in *Chironomus* the front legs are raised, and in the gnats the hinder ones. A closer examination of the two insects will show that the *Chironomus* differs very materially from *Anopheles*, *Culex*, and other of the true gnats in having the mouth-parts unadapted for either piercing or suction; and, from the fact also that the stomach is almost invariably empty, it is conjectured that, in common with many other insects, the *Chironomus* does not feed in the imago state. It is not my intention to enter into the life-history of these interesting insects, for details of which it will be sufficient to refer the student to Miall's recently published works on the subject. Suffice it to say that the females lay their eggs in running water, on the top of which they rest, the ova requiring continuous access to the atmosphere. To prevent them being carried down by the current, and possibly submerged or otherwise destroyed, they are, instead of being permitted to float free, deposited in long rope-like chains, one end of which is firmly attached to the bank or other suitable moorings, the string of eggs thus riding easily at anchor on the surface of the stream. These egg-ropes, which can usually be procured throughout the summer, will prove of deep interest to the young entomological microscopist, for, being of great transparency, it is possible to examine them as living objects, and this, too, without preparation of any kind; so that after examination they can be replaced in the water to continue their development, the whole of which process occupies less than a week. In from three to six days, according to temperature, are hatched little red larvæ, which, when full grown, attain to as much as an inch in length. Their crimson colour has gained for them the popular name of "bloodworms." These, too, are transparent, and furnish most excellent material for the biologist, since the heart, nervous system, and other internal arrangements are easily examined through the clear outer body-wall. But it is in the region of the nuclei of the cells which line the salivary glands that our physiological problem in this species lies. These nuclei will be found to be large, and, in addition to enclosing one or two nucleoli, or smaller spheres, contain a peculiar elongate irregularly-coiled cord, the ends of which, when two nucleoli are present, are joined to both; but should one nucleolus only be enclosed, then it receives the two ends (Miall). What are the

functions of this intricate cord-like structure? What part does it play in the economy of the insect's life? Balbiani (1881) has given us much information respecting the salivary cells and nuclei of the *Chironomus* larva, to whose exhaustive remarks Miall (1895) has added some important observations; but so far no entomological biologist has been able to throw any light upon the very peculiar cords to which I have ventured to direct your attention.

There is another gnat-like fly (*Corethra plumicornis*) which deposits her eggs in a flat mass on the surface of still and shaded pools. From these emerge long slender transparent creatures that, from their peculiar habit of suddenly disappearing by rapidly changing their position, have not inaptly been designated "phantom larvæ." They are highly predaceous, and somewhat smaller than the bloodworms. Limbs are absent, unless a hooked foot-like protuberance at the tail-end can be described as such; but the antennæ being prehensile, the larva makes good use of these in the capture of its prey, which consists for the most part of small aquatic organisms of various kinds. But the curious part about the phantom larvæ is that, although requiring air for breathing purposes, it possesses no spiracles. Is respiration carried on through the body-wall? For, notwithstanding the apparent total absence of external orifices, there is nevertheless a partially developed tracheal system consisting of two tubes running longitudinally through the insect, which, although devoid of air throughout their greater length, dilate into large well-filled air-sacs towards either extremity of the body. Prof. Miall has discovered that in newly-hatched larvæ neither the tubes nor sacs contain any air whatever, and, although a good deal of attention has been devoted to the subject, we are not yet in possession of any facts to lead us to the knowledge as to how air is first admitted to the air-chambers, or subsequently renewed. Is gas generated by the larva itself in a similar way to that by which some fishes are known to inflate their swimming-bladders, and some zoophytes their floats? Bohr and Moreau have given much attention to this latter subject, and the former has shown us that the air-bladder of a fish completely refills after puncture, the gas generated containing as much as 80 per cent. of oxygen. Does the minute larva of *Corethra* employ similar methods to the nautilus, or how is its air evolved? This is yet another of Nature's unsolved mysteries, the satisfactory unravelment of which would probably help us very considerably to understand the fact of the possession of highly oxydised air by many other aquatic animals.

Such, then, are a few of the legion of pertinent questions which ever confront the biological investigator—problems that the entomological student will constantly meet with on every hand. I might allude to many puzzling circumstances in the

life-histories of the earwig, grasshopper, and other well-known insects; but by thus unduly extending my address I should run serious risk of destroying the only merit it stands possessed of, and the only claim it has upon your indulgence to-night, *viz.* its brevity.

I will in conclusion therefore confine myself to the suggestion that there should be more intercommunication and combination, for dealing with matters of general concern to all, between the various Natural History Societies throughout the length and breadth of the land than exists at the present day. Any member who is possessed of sufficient curiosity to fill in, say in two colours, on an ordinary Bradshaw railway map, the various districts covered by members of the different Entomological Societies and Natural History Field Clubs will in all probability find they extend to far greater number and wider distribution than he ever supposed; whilst a cursory glance through the pages of the 'Naturalists' Directory' will disclose the fact that in our ranks are also included many persons of influence. Were, then, some measure of intercourse and mutual support obtaining, it would enable us to devote attention to two important questions, one of vital interest to ourselves, and the other to the community at large. With regard to the first of these—*viz.* that scientific societies in their several districts should either by concerted or other action assist in the endeavour to prevent the enclosing of common land and ground in the possession of the Crown—I have been somewhat anticipated by the very apposite remarks of Dr. Cotton with regard to Delamere Forest, and therefore now only briefly allude to the subject for the purpose of adding one or two additional facts, which it may interest the Society to know. We have it on the authority of Mr. Fortescue Horner, one of H.M. present Commissioners for Woods, Forests, and Land Revenues, that five and forty years ago the woodlands of Delamere extended to nearly 4000 acres, since which time 1800 have been cleared for agriculture and 126 sold. At that period 750 acres of reclaimed land were already let out as farms, a total which at the present day has grown to 2550; so that from 1856 to the end of the century just closed, the woodlands appear to have shrunk from nearly 4000 acres to but little more than half their former dimensions. I am neither a prophet nor a mathematician, and will therefore refrain from prognostications as to the future other than to express the opinion that unless definite action is shortly taken to prevent further encroachments, Delamere will, in the course of a few decades, be a forest only in name. Scientists in the South of England have done much to stop the reclamation of land which formerly obtained in the New Forest, and we ought in no way to lag behind in our endeavour to save the whole of that part of Delamere which now remains for the benefit of future generations of naturalists.

In passing, and as also bearing on this subject of mutual support, I may add that I think we should, as an independent organization, endorse the action taken by the Liverpool Biological Society a few days since in its endeavours to obtain a more thorough recognition of our local fauna in the approaching rearrangement of the City Museum. With regard to our own branch of natural history, the collection of insects in the past can scarcely be said to have been in any way up to date, either as representative of the district, or in the matter of classification and nomenclature; and the time would appear opportune, in view of the additional appointments which at no distant date will have to be made, for us as the recognised Entomological Society of this part of South-west Lancashire to express the hope that the Museums Committee may find it possible to add an entomological expert to the already hard-worked staff of the distinguished Director of our City Museums.

With regard to the second question, one cannot help feeling that much good work is done by entomologists which is never heard of outside the narrow confines of their several districts, and except during seasons of abnormal appearance of certain rarities, such as *Ægialia rufa*, *Colias hyale*, *Deilephila galii*, &c., we hear nought of the locality to which they belong. Can it be that during the intervening years nothing of general interest has been learnt; nothing observed which might prove of ultimate value? I cannot think this, but I *do* think that, owing to the "splendid isolation" from which scientific societies, like our great daily newspapers, sometimes affect to ignore one another's existence, much important knowledge on lesser rarities is irretrievably lost. And, after all, it is with the *less* rare insects that our country generally is most vitally concerned—pests like the turnip beetle (*Phyllotreta nemorum*, *P. undulata*, &c), magpie and codlin moths (*Abraxas grossulariata* and *Carpocapsa pomonella*), daddy longlegs (*Tipula oleracea*, *T. maculosa*), &c. Would it not be possible for every natural history society, in addition to the important local work in which they are now mostly engaged, to contribute yearly valuable information on many economic questions of general importance to the community, by forming a small committee to receive and arrange the observations of its members on their experiences during the year of any abnormal variation in abundance of some of the commoner and more injurious insects in their several branches of entomology, as well as to tabulate any remarks they might make on the subject? Any inquiry into the question of such variation prevailing during a sequence of years would be of course of an exceedingly intricate and complex nature; and as it is probable that weather, and especially temperature—as distinct from climate—acting either directly at some critical epoch in the insect's life, or indirectly through food-plants, &c., would be largely responsible for many

of the phenomena noted, it would be the duty of the committee to add also a concise epitome of any special *local* feature in the type of weather experienced over the district from which the observations had been gleaned. All meteorological conditions of a general character could be obtained from the records of the Royal Meteorological Society's one hundred climatological stations established in various parts of the kingdom, and these would of course be available to the specially appointed Central Committee, to which at the end of each season every society would forward its report for arrangement and comparison.

The value of such records might not at first be very apparent, although they would early serve to show us whether the appearance of any insect pest was of a general or only local nature, and, if the latter, the Central Committee would pay particular attention to the reports received from the stricken districts with the object of discovering any possible reason for such occurrence. In the course of a decade or two a mass of carefully arranged observations and details from all parts of the kingdom would be in the possession of this committee, from which it is certain many important facts would have already begun to manifest themselves, and every year would naturally add to the value of the records by furnishing us with increasing data upon which both to base our theories and determine our facts.

That the rough scheme here sketched may appear difficult of attainment in the crude and skeleton form in which I have presented it, there is no one more sensible than myself. Nevertheless I do not regard the subject as chimerical, nor as one more fitted to the columns of 'Punch' than inclusion in the transactions of a scientific society. Our grandfathers would have been sceptical of the possibility of obtaining from a central bureau in London daily forecasts of the weather for all parts of the kingdom, yet we are perfectly accustomed to the practice. But how many of *us* a year or two ago would have dreamed of the value shortly to be attached to the yearly reports of the irregular rainfall in India; whilst fewer still would have imagined that a large portion of humanity was soon to benefit by the accumulating records of so apparently uncommercial a proceeding as the study of the spectra of sun-spots. Yet observations of these two seemingly fortuitous events covering a sequence of years exhibit sufficient method and connection to warrant Sir Norman Lockyer's stating that one of the great scientific triumphs of the early years of the present century will be the ability not only to foretell approaching droughts in Australia and famines in Hindustan, but to add details as to area and extent. And who knows but that, just as the British farmer now scans in his morning paper the weather predictions for his district, so that farmer's grandson may in future years pay even greater attention to the monthly or other periodic forecasts of the Economic Entomologist's Depart-

ment of the Board of Agriculture—predictions of the probable occurrence of various insect pests that would be based on the relations that had been observed to exist between certain natural phenomena extending over a considerable number of years, which would render it possible to issue timely warning and advice of inestimable advantage to the agriculturist and incalculable value to the nation at large.

I trust then that the few disjointed remarks it has been my privilege to address to you this evening may serve to stimulate us to a more intense interest in the fascinating study of insect life, more especially with a view to the solution of such economic questions of importance to cultivators of the soil as that to which I have just alluded,—a study which, whilst providing us with every opportunity for pleasant recreation and interesting investigation ourselves, will afford us additional gratification by the knowledge that we are also contributing to relieve the anxiety, lighten the labour, and increase the prosperity of thousands of our fellow men.

NOTES AND OBSERVATIONS.

HECATERA SERENA LARVÆ NOT ON GOAT'S-BEARD.—Mr. L. B. Prout has kindly written to me about the supposed larvæ of *Hecatera serena* feeding in the flowers of goat's-beard near Chester (*ante*, p. 105). His interesting letter makes the supposition that the larvæ were *H. serena* so improbable, that, with his permission, I give his remarks upon the species in full. He says:—

“Unless the species has very different habits at Chester from the normal, I cannot conceive that you can have been ‘too late’ for the larva on June 18th, and half fancy your ‘informant’ must have been poking fun, and that it was something else which had hollowed out the flowers of goat's-beard. In all places where I have collected, the imago of *serena* is just in its prime in the latter half of June and beginning of July, and as the larva follows the imago in the same year (*i. e.* the species hibernates in pupa), June 18th seems an impossibly early date. Moreover, I doubt if you will find ‘goat's-beard’—by which I understand the common ‘Jack-go-to-bed-at-noon’ (*Tragopogon pratense*) of our meadows—its usual foot-plant. This goat's-beard, with its grass-like leaves, is in flower in June, which, as I have just said, is too early for my experience of *serena* larvæ. I used, misled by Newman, to search for it on ‘sow-thistles,’ but some notes by Dr. Riding and Mr. Fenn some years ago (*Ent. Rec.* ii. p. 290, iii. p. 84) raised doubts whether it ever fed naturally on these, and suggested that it should be sought on ‘hawk's-beard’ (*Crepis*). I immediately put this hint to the test—about July 20th, at Sandown—and beat three larvæ, half-size to nearly full grown, out of the very first batch of *Crepis* which I tried. The species, however, seems rather scarce at Sandown, and it was not till 1898, when I visited

Torquay, that I found the larvæ in abundance. Here, too, they were confined to the *Crepis*, though plenty of sow-thistle (*Hypochaeris*) and other Compositæ grew close at hand. The larvæ when young sit quite exposed by day on the flowers, and as soon as one has once 'got one's eye in' they are extremely easy to see—a green larva sitting stretched across a bright yellow flower. Of course, they are better protected when they sit curled round the calyx, but they are easily beaten off. They are full-fed about the beginning of August, or on till beyond the middle of that month. In confinement they will eat almost any composite flower, including our plebeian dandelion. Unfortunately, a large percentage are 'stung.'

The following additional particulars I take from 'Wilson's Larvæ': Imago of *Hecatera serena*, June and July; larvæ, July and August; pupæ, September to May. What the caterpillars were which hollowed out the flower-heads of the goat's-beard it is difficult to say. But the matter will not be lost sight of. Wilson gives only two species of Lepidoptera as feeding on the flowers—*Calocampa exoleta*, the larvæ occurring from April to July, and *Amphipyra tragopogonis*, larvæ in May and June. *C. exoleta* is not a common insect with us, but, as *A. tragopogonis* certainly is, the larvæ were probably the latter species.—J. ARKLE; Chester.

MOTHS CARRIED OFF SUGAR BY SAND-HOPPERS (*TALITRUS LOCUSTA*).—At one time I used to sugar posts and pieces of drift-wood on the coast just above high-water mark for *Agrotis ripæ*, &c., but the patches of sugar were usually so densely covered with sand-hoppers there was scarcely any room left for moths, so I had to give it up and retire to where the posts and palings were further removed from the beach. On several occasions I have seen *A. ripæ* being carried off by one of these creatures, and once I rescued a very fine variety, which was quite uninjured, and making no attempt to escape from its captor.—GERVASE F. MATHEW; Dovercourt, March 14th, 1901.

RHIZOBIUS JUJUBÆ.—A supposed aphid is described under this name by Mr. G. B. Buckton in 'Indian Museum Notes,' 1899, p. 277, pl. xvii. It there appears as a new species, though I find *Rhizobius jujubæ*, Buckton, with a diagnosis, in Mon. Brit. Aphides, vol. iv. (1883), p. 181. The insect is found in India on the roots of *Zizyphus jujuba*, and is, to all appearances, judging from the description and figure, a coccid. It does not seem exactly to fit in any known genus, so it seems desirable to call attention to it, in order that those who have the opportunity may be led to determine its true affinities.*—T. D. A. COCKERELL; Jan. 16th, 1901.

MELITÆA ATHALIA IN DEVON.—While taking *M. athalia* in Devonshire on June 13th, 1897, I captured a specimen of the var. *navarina*, very similar to that figured on p. 46 of Newman's Brit. Butt. (the first of his three lower figures), but with the orange spots on the

* It may be worth while to remark, that the name *Rhizobius*, Burm., for an aphid, conflicts with *Rhizobius*, Steph., applied to a coccinellid beetle. The latter was originally published as *Rhyzobius*, it appears, in 1835, the same year that saw the publication of the aphid genus. I have no means of ascertaining which has priority.—T. D. A. C.

borders of the posterior wings much more elongated.—R. S. MITFORD; 35, Redcliffe Square, South Kensington, March 4th, 1901.

THE COURTSHIP OF *ANTHOCHARIS CARDAMINES*.—Since the spring of 1899, there has been on my notes an observation which I have not ventured to publish because confirmation was wanting respecting the interpretation which I was inclined to give to the fact in question. In the present (March) number of the 'Entomologist' (p. 73) Mr. Guy A. K. Marshall has, however, independently arrived at a similar conclusion in the case of the South African Pieridæ, and it seems therefore desirable to place the observation upon record. At the period mentioned I noticed near Dunmow, in Essex, a male *C. cardamines* hovering round, and advancing towards and receding from, a female of this species sitting low down among the herbage with open wings and raised abdomen, precisely in the attitude described by Mr. Marshall. It seemed at first sight as though the male had been a successful suitor, and that pairing would take place. The female remained quite passive, and in no way repelled the advances of her suitor. For more than fifteen minutes the male continued his evolutions, and then, without being in the least disturbed by me, the insects parted company and flew away in different directions. I was much puzzled at the time to explain why, with no other rival in the field, and with an apparently passive female, the courtship should have ended in this apparently fruitless way. It afterwards occurred to me, on thinking the matter over, that the passivity and attitude might have been indications that mating had previously taken place, and that the new suitor had been warned off for this reason. This conclusion I now find to be completely in harmony with Mr. Marshall's wider experience. I do not know how long the male had been paying his attentions before his evolutions attracted my attention, but it was certainly more than fifteen minutes after my arrival before he realised that his suit was a useless one. This observation appears to me of interest also as indicating that in this species the male is the wooer, and this, from the point of view of the theory of sexual selection, is in accord with the fact that he is the more brilliantly coloured.—R. MELDOLA; 6, Brunswick Square, W.C., March 16th, 1901.

IRREGULARITY OF EMERGENCE, AND LARVAL RETARDATION.—Reading with interest Mr. Merrifield's notes on irregularity in emergence of the Drepanidæ (*ante*, p. 98), some similar observations made last year may be worth recording.

Plusia iota.—Sixteen larvæ of this species were successfully hybernated, during the winters of 1899 and 1900, amongst dead leaves of *Lamium album*, all having hatched on the same day the previous summer, and being of very similar size during hibernation. Feeding was resumed about February 18th, and all the larvæ but one began to spin their cocoons from April 23rd to 25th, the moths emerging from May 27th to June 4th.

The one exception, although perfectly healthy, appeared to cease growing almost entirely during April, whilst the others were rapidly maturing, but after the middle of May seemed bent on making up for lost time, being full-fed about June 6th, when it was unfortunately

allowed to escape, so that I have no note of the precise period of the retardation of emergence behind the others of the brood.

Pararge egeria.—Five ova were laid on July 3rd, the larvæ hatching on the 14th. The first pupation took place on August 11th, and that of two more a few days later. At this period the two remaining larvæ were less than half-grown, one pupating on September 19th, the other a day or two later. These two are now hybernating, apparently quite healthy, as pupæ; but the former three, after imaginal development had reached an advanced stage, dried up and failed to emerge, doubtless owing to unnaturally dry artificial conditions during a period of unusual heat.

Lycæna argiolus.—Ova from the first brood were laid on May 28th, the succeeding larvæ being full-fed about June 23rd. All but five of the ensuing pupæ emerged in due course on July 12th and subsequent few days; these five are now hybernating, and appear to be quite healthy. In contrast to this, it may be of interest to record that one pupa of some two dozen of the second brood, September, 1895, produced a female butterfly of a third brood, the same autumn, all the other pupæ waiting, in the usual course, until the following spring.

Lycæna alexis.—Ova laid June 18th, hatched 29th; larvæ developed well for a few weeks, feeding on young pods of *Lotus*; then all, with one accord, ceased growing or feeding entirely, although offered various other Leguminosæ, but remained about a quarter grown, and were alive, but still in this stage, in October last.

Anticlea badiata.—A number of larvæ from ova, fed up well and rapidly, last spring. On October 20th a female emerged, slightly undersized, but not otherwise different from those now appearing from the same brood (March 18th, 1901). These latter are all slightly over the average size.

Melanippe unangulata.—Ova laid July 10th, hatched 19th; had all gone to earth by August 14th. On the 25th of the same month a moth emerged, followed by eight more subsequently. These moths are all decidedly smaller than specimens taken at large at the usual time of flight. The greater number are still hybernating as pupæ.

Chrysophanus phlæas.—Contrary to previous experience with this species, some two dozen, reared from ova last year, formed an example of simultaneous growth and development. Ova laid July 8th, hatched 17th and 18th; all the butterflies emerged between August 21st and 28th.

Colias edusa.—Considerable difference in rate of larval growth was observed with this species, but of a rather different significance than attaches to those mentioned above; inasmuch as delay seemed generally, though not always, to be the accompaniment of feeble vitality, such specimens that were much behind the others either producing diminutive specimens, or else failing to reach maturity.

In all the above instances, larvæ of each species were always confined in the same cage, suitable to their successive changes, and fed on the same leaves, the pupæ being also kept together; so that the unnatural uniformity of conditions in captivity serves to emphasize the importance that these irregularities must have to the species in nature, and can scarcely fail to be a powerful factor in the production

of those unaccountable "profusions" and "scarcities" of many species, which are so constantly recorded.—R. M. PRIDEAUX; Reigate, Surrey.

KNAGGS'S LEPIDOPTERIST'S GUIDE.—A third edition of this exceedingly useful work has just been published. We have not seen a copy, but understand that it contains many additional pages and illustrations, and although issued in cloth covers the price remains as heretofore, *i. e.* one shilling. The veteran will surely find the 'Guide' of service to him, whilst to the tyro it is simply indispensable.

INSECT FAUNA OF NOTTINGHAMSHIRE.—I am preparing for publication a list of the insects of this county, and shall be grateful for any information, list of captures, &c., from entomologists who have worked in the county.—J. W. CARR; University College, Nottingham.

ADDENDUM.—P. 37, insert: 1889.—On the Lepidoptera of Japan and Corea. Pt. iii. Noctues and Deltoides (Proc. Zool. Soc. Lond. 1889, pp. 474-571, pls. l.-liii.).

CAPTURES AND FIELD REPORTS.

COLIAS HYALE IN JUNE. — Looking through back numbers of the 'Entomologist,' and seeing the numerous records of captures of *C. hyale* during August and September of former years, I thought it might be interesting to mention that I caught an example in June, last summer, at Folkestone. I believe the date was June 16th, though it possibly might have been a day or two earlier or later. It was a poor specimen, but gave a most "sporting run." I have been told that it was probably a continental specimen. Is this so? I might also add that I caught a nice variety of *C. edusa* in Cornwall, in September. Its colour was between that of typical *C. edusa* and its white variety *helice*.—W. G. THEOBALD; Trinity College, Cambridge, March 3rd, 1901.

XYLOMIGES CONSPICILLARIS IN SOMERSETSHIRE.—I have to report this insect from the Taunton district. From dug pupæ a friend and myself have procured the following:—In 1899, three; in 1900, two; and this year two, up to the present time. On looking through the private collection of the late Curator of the Taunton Museum, I noted one specimen, which he told me he took about twenty years ago, on a gas-lamp. I see Newman mentions only three localities, and adds: "This insect is exceedingly rare in Great Britain." I shall be glad to know if this is still the case.—HARRIS DOIDGE; The Elms, Sherford, Taunton.

ORTHOPTERA FROM RENFREWSHIRE.—Mr. A. M. Stewart has sent me a specimen of *Gryllus domesticus*, and another of *Stenobothrus viridulus*, from Kilbarchan, together with a *Blatta australasiae*, which last was obtained alive, in a fruiterer's shop in Paisley. It came out of a cluster of bananas from the Canary Islands, though of course it may have been taken on board previous to the vessel's arriving there.—W. J. LUCAS; Kingston-on-Thames.

CAMPTOGRAMMA FLUVIATA AT RHYL, FLINTSHIRE.—On Aug. 2nd, 1900, a small geometer came to window-light here; to establish its identity it was submitted to Mr. Barrett, who pronounced it to be "a beautiful female

fluriata." The markings on the wings are more distinct than those in Newman's illustration, the median bar being broken. I believe it to be the first of its species recorded for North Wales, and it is now in the Grosvenor Museum, Chester.—(Miss) A. STEELE PERKINS.

VITALITY OF HYBERNIA RUPICAPRARIA.—On Feb. 17th I found a specimen of *H. rupicaprarica*, on a pond covered with ice nearly an inch thick; I broke the ice, and put the piece containing the moth in a box; the insect must have been in, or on the ice about two days; there was quite a quarter of an inch of ice over the moth. When I got home I dissolved the ice, and found that the moth was quite perfect. I was surprised when I looked at it two hours later to find it alive.—T. L. HOWE; Beaufort House, Penarth, South Wales.

PHLOGOPHORA METICULOSA IN WINTER.—On Feb. 15th last I had a specimen of *P. meticulosa* brought to me by a lad, who found it on an oak-tree on Wimbledon Common. On March 23rd, last year, I took an example of this species at sallow. I also took a specimen on a fence in Richmond Park, Dec. 30th, 1899.—J. MILLER; 44, Longfield Street, Wandsworth, S.W.

A specimen of *Phlogophora meticulosa* was taken on palings on Dartford Heath, as early as March 3rd this year. My previous earliest record is March 31st, 1899, at sallow, in the New Forest.—I have taken the full-grown larva in January.—F. M. B. CARR; 46, Handen Road, Lee, S.E.

[See also Entom. xxxiii. 13.—Ed.]

EARLY APPEARANCE OF PIERIS RAPÆ IN LONDON.—On March 21st, as I was walking down John Street, Adelphi, at 5.30 in the afternoon, something white fluttered down on to the pavement in front of me. I picked it up and found it to be a *P. rapæ*, evidently just fresh out. It probably came from the Embankment Gardens, which were not far off; but it is difficult to understand why it should have emerged on such a day, for there was then, and had been all day, a bitterly cold and very high wind from the north-east.—ARTHUR COTTAM; Eldercroft, Watford.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—February 6th, 1901.—The Rev. Canon Fowler, M.A., F.L.S., President, in the chair.—The President moved that an address of condolence and congratulation be presented by the Society to his Majesty King Edward VII. on his accession to the throne, and remarked that in 1833, when the Society was founded, her Majesty the late Queen, with her mother the Duchess of Kent, was the first to sign the book subscribed by members and fellows upon admission to the Society. The motion was seconded by Col. Swinhoe and carried unanimously.—Mr. E. B. G. Nevinston, of 3, Tedworth Square, Chelsea, was elected a Fellow of the Society.—The President announced that he had appointed as Vice-Presidents, Mr. C. G. Barrett, Mr. E. Saunders, and Mr. G. H. Verrall.—The President exhibited a specimen of *Colias edusa* var. *helice* with the margins of the wings entirely dark as in the male; also a variety of *Carterocephalus palamon* with the hind wings dark save for one conspicuous orange spot.—Dr. T. A. Chapman exhibited a large series of *Endrosæ* collected during

the last few years by himself, Mr. A. H. Jones, and especially by Mr. Tutt; *E. roscida*, which is a very distinct dwarf form, and from frequenting marshy flats must live on lichens growing in such localities, and not on stones as the others do; *E. irrorella*, which should be the rarest species in the Alps, judging by the comparatively few specimens met with; *E. aurita*, in very great variety, including a good many specimens that are called *kuhlweini* var. *alpestris*, none, however, reaching the type of *kuhlweini*, but sufficient to show with something approaching to certainty the question whether *kuhlweini* is simply an extreme form of *aurita*. *E. aurita* and *E. irrorella*, said Dr. Chapman, are very near together, no point in their anatomy being absolutely distinctive, while the genitalia are practically identical; *E. irrorella* always looks much slighter, being lighter scaled and the hairs short and smooth. It always has a yellow patch on the mesothorax. The venation is also distinctive, yet individuals of each species approach each other completely in each of the distinctive items of the venation, but never in all of them, so far as examination of a number of specimens goes. The specimens exhibited consisted of twenty-four *roscida* from two localities, twenty-two *irrorella* from eight localities, and two hundred and four *aurita* from twenty-three localities. Except *irrorella* from England, Finland, and the Tyrol, and a few *aurita* from the Tyrol, all were from the Western Alps of Switzerland, Italy, and France. Examples from each locality when sufficiently numerous usually have a special facies. Some, as all those from Arolla, radiate; those from Bourg St. Maurice are without radiate forms; and so on. Some are more yellow; others deeper orange; some more mixed. Elevation tends to produce radiation, but no other general conclusion as to the effect of height, latitude, or longitude seems fully justified by the specimens.—Mr. C. G. Barrett exhibited, for Mr. G. O. Day, of Knutsford, a black variety of *Aplecta nebulosa*, Tr., with white cilia, and an asymmetrical female var. of *Fidonia atomaria*, Linn.—Mr. M. Jacoby exhibited a specimen of an unknown species of the Halticidæ.—Mrs. Nicholl exhibited a collection of Rhopalocera from the Lebanon district of Syria, and Mr. H. J. Elwes, on her behalf, read a paper explaining and illustrating the several species included. He said that Mrs. Nicholl's expedition had been both remarkable and successful. The lepidopterous fauna of this region was less known than that of other parts of Western Asia, and interesting inasmuch as the mountains of high Lebanon contained a larger proportion of Alpine species than might have been expected. Among other species Mr. Elwes drew special attention to *Thecla myrtale*, which, since it was described by Klug in 1832, has remained one of the least known members of the palæarctic fauna. No examples, it appears, had been taken in the interval until Mrs. Nicholl found it on the high mountains not uncommon in May and June. *I. asterope* was taken in some numbers on the coast, the species being the sole representative of its family between Syria and Manchuria. The Nymphalidæ also showed a great range of variation. Sir John Llewellyn, Bart., made some remarks on the character of the country through which Mrs. Nicholl had travelled, and, in reply to Mr. Jacoby, Mrs. Nicholl said that insects are not abundant generally, and the more productive spots are few and far between.—The following papers were communicated: "A revision

of the genus *Astathes*, Newm., and allied genera of Longicorn Coleoptera," by C. J. Gahan; and "A preliminary catalogue of the Lepidoptera-Heterocera of Trinidad," by W. J. Kaye. — H. ROWLAND-BROWN, *Hon. Sec.*

March 6th.—The Rev. Canon Fowler, M.A., F.L.S., President, in the chair. — Mr. E. W. Lane, of 9, Teesdale Street, Hackney Road, N.E., was elected a Fellow of the Society. — Mr. H. St. J. Donisthorpe exhibited a parasitic Braconid, bred from the galls of *Centothlypnus sulcicollis* on turnips, together with the host. — Mr. A. J. Chitty exhibited a variety of *Psylliodes cyanoptera*, Ill., the coloration of the thorax dark instead of the usual red, taken by him along with the typical form in August, 1892, at Wicken Fen, close to the Pumping Station. — Mr. H. J. Turner exhibited a long series of *Bryophila muralis* (*glandifera*) from Dawlish. The whole were either taken on, or bred from pupæ cut out of, a single roadside wall some hundred yards long, very lofty, and facing nearly north, on which aspect, however, it was protected by higher ground. They were obtained in mid-August, with the exception of a few which emerged at intervals during September and October, 1900. Generally speaking, the specimens were very dark, and the series was remarkable in that it contained but a few isolated examples of the forms which are prevalent in more eastern localities like Freshwater, Eastbourne, or Folkestone. The hind wings of all the specimens were dark, while, in the majority, the black markings of the fore wings were much intensified and increased in number, and a few specimens were largely suffused with black. A considerable number showed a dark rich green suffusion, while a large proportion were of a very deep yellow or olive colour with black markings. The yellow forms were perfectly natural, as a number emerged from the pupa exactly of that hue. Only a few showed any trace of the typical delicate dove-colour, and it was also noteworthy that the wings had a comparatively much greater area of black scaling than the eastern forms. — On the motion of Mr. H. J. Elwes; seconded by Mr. H. Goss, it was resolved that a Committee be appointed to consider the question of uniformity in nomenclature for the guidance of specialists contributing to the Victoria County Histories. — The following papers were read:—"Cetoniidæ collected by Messrs. H. E. Andrewes and T. R. D. Bell in the Bombay Presidency, with descriptions of the new species," by O. E. Janson; and "A Supplementary Catalogue of British Ichneumonidæ," by Claude Morley. — H. GOSS and H. ROWLAND-BROWN, *Hon. Secs.*

SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY. — January 10th, 1901. *Annual General Meeting.* — Mr. W. J. Lucas, B.A., F.E.S., President, in the chair. — The Report of the Council, showing the work of the Society, was read, and the balance-sheet was adopted. The following list of Officers and Council were declared elected for the ensuing year:—President, H. S. Fremlin, M.R.C.S., F.E.S.; Vice-Presidents, F. Noad Clark, and W. J. Lucas, B.A., F.E.S.; Treasurer, T. W. Hall, F.E.S.; Librarian, H. S. Sauzé; Curator, W. West (Greenwich); Hon. Secretaries, Stanley Edwards, F.L.S., F.E.S., and Hy. J. Turner, F.E.S.; Council, R. Adkin, F.E.S., W. J. Ashdown, T. A. Chapman, M.D., F.E.S.; A. Harrison, F.L.S., F.E.S.;

A. M. Montgomery; E. Step, F.L.S.; and J. W. Tutt, F.E.S. The President read his address, and votes of thanks to the retiring Officers and Council were passed. A proposal was made to close the rooms during the summer holiday season, but it was not passed by the meeting.

February 14th.—Mr. H. S. Fremlin, M.R.C.S., F.E.S., President, in the chair.—Mr. Garrett, of Brewer's Green, was elected a member. Mr. Colthrup exhibited a drawing of a dashed and radiated under side var. of *Polyommatus icarus*, taken by Mr. Hill, of Folkestone. Mr. Wyandotte, a large number of specimens of amber having insects embedded in them. Mr. West (Streatham) read a paper, "Fossil Insects, with especial reference to insects in amber." He afterwards showed a very large number of photographic lantern slides of insects in amber. HY. J. TURNER, *Hon. Report. Sec.*

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.—The Annual Meeting was held on Monday, January 14th, in the new room taken by the Society at the Royal Institution, Colquitt Street, Liverpool. The Vice-President, Mr. E. J. Burgess Sopp, occupied the chair. The Secretary read a report on the work of the year 1900. The Treasurer read his report, which showed a credit balance of 15s. Mr. Pierce mentioned incidentally that the Library had been brought over to the new premises, and would be lodged in an adjoining room as soon as space could be found for it. The election of officers for 1901 was then proceeded with, and resulted as follows:—President, S. J. Capper, F.E.S.; Vice-Presidents, R. Wilding and Rev. R. Freeman, M.A.; Secretaries, F. N. Pierce and Fredk. Birch; Treasurer, Dr. J. Cotton, F.E.S.; Librarian, F. C. Thompson. Council, A. Tippins, B. H. Crabtree, F.E.S., R. Tait, E. J. Burgess Sopp, F.E.S., and Dr. H. Dobie. The outgoing Vice-President, Mr. E. J. Burgess Sopp, then gave a most interesting and instructive address. The Rev. R. Freeman proposed a hearty vote of thanks to Mr. Sopp; this was seconded by Mr. Wilding, and carried unanimously. Dr. Cotton proposed, and the members agreed, that the Secretary should write to the President, expressing their regret at this his first absence from the Society's annual meeting for so many years.

Monday, February 11th.—The usual monthly meeting was held in the Royal Institution, Colquitt Street, Liverpool, with the Vice-President, Mr. R. Wilding, in the chair. Minutes of the preceding meeting were read and confirmed. It was decided by a vote that the next meeting should be held at St. Helen's. Mr. F. C. Thompson, Rev. R. Freeman, and Dr. J. Cotton were appointed to make the necessary arrangements. The Secretary read a letter from the President, Mr. S. J. Capper, thanking the members for the regrets and good wishes they had caused to be sent to him on the occasion of his first absence from the Society's annual meeting, held on January 14th, on which date Mr. Capper's place had been filled by Mr. E. J. Burgess Sopp, who gave a stirring address. The joint Secretary, Mr. Frederick Birch, then read a paper entitled, "Our Raid into the Highlands," in which he described what he and his companions, Messrs. J. and H. Tayler, did and saw at Rannoch (north-west Perthshire) in the summer of 1900. Starting from Liverpool by steamer on the 16th of June, they

landed, after a delightful trip up the west coast of Scotland, at Fort William in the evening of the 18th. From thence, wheeling their two hundred pounds of luggage (camping, entomological, and photographic apparatus), they proceed inland to the foot of Ben Nevis. Here they stayed for two days—climbing the mountain, exploring the glen, and learning “what Nature can do in the way of adornment when left to herself.” On the 20th they entrained for Rannoch. Arrived there, they restocked their box with provisions from the single store, and started on a twelve mile walk to the far-famed Black Wood of Rannoch, lying on the flanks of the hills forming the southern shore of Loch Rannoch. Here, betwixt the wide loch and the deep wood, they encamped, and for nine delightful days, lived a wild, free, gipsy life, collecting the insects, observing the wild mammals and birds, and revelling in the primitive loveliness by which they were surrounded. The finest bird seen was an eagle, which the essayist observed (mobbed by lapwings) in its stately flight over the Black Wood. Amongst the rare species of Coleoptera taken may be mentioned *Saperda scularis Eros aurora*, and *Trichius fasciatus*. Of Lepidoptera, the best were, *Dasytia obfuscata* and *Psodos trepidaria*. Mr. Pierce proposed a vote of thanks to Mr. Birch for his paper, which was carried unanimously. The Rev. C. J. Buckmaster, of Wigan, gave some interesting reminiscences of the Rannoch district, which extended over a period of thirty years. The following exhibits were made:—*Noctua subrosea*, by Mr. Pierce; Devonshire and local Lepidoptera, by Mr. Tonkin; Scotch Coleoptera and Lepidoptera, by Mr. Birch; *Saturnia pavonia major*, taken in the south of France, by Mr. Gardner; *Ephestia kühniella* feeding on rice, by Mr. Holt; and two species of the genus *Stilicis*, new to the local list, by Mr. Wilding.—FREDERICK BIRCH, Joint Hon. Sec.

BIRMINGHAM ENTOMOLOGICAL SOCIETY.—October 15th, 1900.—Mr. G. T. Bethune-Baker, President, in the chair. A letter was read from Mr. C. A. E. Rodgers, mentioning the occurrence of *Colias edusa* on the golf-links at Handsworth, only about four miles from the centre of Birmingham. Mr. T. Clarke exhibited a number of butterflies, mostly taken in Yorkshire forty years ago; they were in excellent preservation. Mr. Bradley, Hymenoptera taken at West Runton, Norfolk, in August last—*Tiphia femorata*, *Mellinus sabulosus*, *Mimesa equestris*, and *Astata boops*. Mr. F. A. Jackson, the following Coleoptera:—*Notiophilus 4-punctatus*, *Bembidium monticola*, *Tachypus flavipes*—all from Tonbridge; *Phyllobrotica 4-maculata* from Bradgate (Leicestershire), *Crioceris asparagi* from Loughborough (Leicestershire), *Apoderus coryli* from Haywood near Birmingham, *Balaninus venosus* from Buddon Wood (Leicestershire), &c. Mr. H. Willoughby Ellis, the following Hemiptera-Heteroptera from Stroud district:—*Ælia acuminata*, *Ælioides inflexus*, *Pentatoma verbasci*, *Dasycoris hirticornis*, *Stenocephalus agilis*, *Nabis rugosus*; also, from the Knowle district, *Anthocoris nemorum*, *Monanthia cardui*, *Scolopostethus contractus*, *Acanthosoma griseum*, &c.; also a number of Coleoptera from various places, including *Anoplodera sexguttata* (New Forest, 1898), *Acanthocinus ædilis* (Walsall, 1900), *Larinus carlinæ* (Stroud, June, 1900), *Corymbites æneus* (Dovedale), *Cteniopis sulphureus* (near Cromer), *Melasis buprestoides* (Knowle), *Bryaxis juncorum* (Knowle), &c.; also *Sesia asiliformis* (from

Knowle, July, 1898), and *S. culiciformis* (also from Knowle, May, 1898). Mr. A. H. Martineau exhibited Hymenoptera, including *Crabro 4-maculatus* from Coleshill, *Chrysis viridula*, L., and *Chelostoma campanularum*, Kirby, from Solehill; also *Hæmatopota pluvialis* (male) from Coleshill, and *Platynemus pennipes* (male and female) from Bridgnorth. Mr. G. W. Wynn, *Xanthia citrigo*, *Xylophasia scolopacina*, *Cymatophora duplaris*, and *Gonophora derasa*—all from Haywood this year.

November 19th.—Mr. R. C. Bradley in the chair. Mr. Dixon, 149, Edmund St., Birmingham, was elected a member of the Society. Mr. H. Willoughby Ellis exhibited *Melasoma æneum* from Cannock Chase; *Crioceris asparagi* from Bromsgrove (where it occurred in thousands); *Sinodendron cylindricum* from Knowle; *Byturus sambuci* from Haywood; and *Sitones cambricus* from Knowle; also a few Lepidoptera from Knowle. Mr. G. W. Wynn, a number of Lepidoptera taken at sugar, in his garden at Hampton-in-Arden. He sugared regularly all this summer and found July the best month. *Triphæna ianthina* was especially abundant, often five or six being on one patch of sugar; also two *T. interjecta* turned up; and amongst other things were *Xylophasia sublustris*, *X. hepatica*, *Caradrina morpheus*, *C. alsines*, *C. cubicularis*, *Agrotis nigricans*, *A. tritici*, *A. corticea*, *Noctua umbrosa*, *Xanthia gilvago*, *Tethes subtusa* (1), *Cosmia affinis* (common), *Cutocala nupta* (1), *Mania maura*, &c., &c. Mr. A. H. Martineau showed *Crabro clavipes*, *C. tibialis*, *Stigmus solskyi*, and *Trypoxylon clavicerum*, all from Solihull this year. Mr. R. C. Bradley, a number of insects of various orders collected during four days' trip to the Cotswolds, near Stroud, at Whitsuntide this year; amongst other things taken were *Isopogon brevisrostris*, *Platystoma seminationis*, *Xanthogramma ornata*, *Trixa æstroidea*, *Hyalomyia pusilla*, and the following bees, *Andrena cingulata*, *Osmia xanthomelana*, *O. bicolor*, *O. cærulescens*, *O. aurulenta*, *Nomada flavoguttata*, *N. laterales*, &c. Mr. Colbran J. Wainwright, his collection of the Diptera of the families Trypetidæ and Ortalidæ, including several interesting species taken this year—*Trypeta cornuta*, *T. tussilaginis*, and *Tephritis bardanæ*; long series from West Runton, Norfolk, where all three species were very abundant; *Urellia eluta* and *stellata*, *Tephritis tessellata*, *Eusnia sonchi*, all from W. Runton, *eluta* being only in italics in Mr. Verrall's list, and *T. tessellata* being absent from it; *Ceroxys crassipennis* from Stroud district, &c., &c.

December 17th.—Mr. G. T. Bethune-Baker, President in the chair. Messrs. Aug. D. Imms, Linthurst, Oxford Road, Moseley, and W. H. Flint, Farm Road, Sparkbrook, were elected members. Mr. R. C. Bradley exhibited *Sirex juvenis*, taken at Bournemonth in August last, and *S. gigas*, taken at W. Runton, Norfolk, also last August. Mr. Colbran J. Wainwright, a number of Aculeate Hymenoptera, taken at W. Runton, Norfolk, July and August last, including *Nysson dimidiatus*, *Astata boops*, *Tachytes pectinipes*, *Mellinus sabulosus*, *Tiphia minuta*, *Andrena cetii*, *A. bimaculata*, *Nomada obtusifrons*, and many others; also three females of *Odynerus gracilis* from Ran Dan Woods, a species not previously known in the Birmingham district. Mr. F. A. Jackson, a number of Coleoptera, including *Chlænus vestitus*, taken at Bewdley on October 19th last. Mr. G. T. Bethune-Baker showed a number of Palearctic *Epinephela* and *Pararge*.

January 21st, 1901.—The President in the chair. Drs. T. H. Wilkins, Small Heath; and W. Wright Mason, University College, were elected members. Mr. R. C. Bradley showed a series of *Pelecocera tricineta* from Bournemouth, where he had taken it fairly commonly this year, more so than anyone had previously done; also *Anthrax fenestrata* from Bournemouth, *A. paniscus* from West Runton, Norfolk, and *A. flava* (?) from Bournemouth, all taken this year by him, though he had never met with a specimen of the genus before; also all three species of *Didea*—*alneti* from Sutton and Wyre Forest, *intermedia* from Sutton, and *fasciata* from Sutton, Wyre, and Poole. Mr. A. D. Imms exhibited *Sinodendron cylindricum* from an old oak at Moseley. Mr. C. J. Wainwright, a series of *Stratiomys chameleon* from West Runton, Norfolk, taken last July and August. Mr. G. T. Bethune-Baker, a drawer full of *Epinephele ianira* and its allies.

February 4th (Annual Meeting).—Mr. R. C. Bradley in the chair. The Annual Report of the Council was read, showing an increased number of members in the Society; and the Treasurer presented his annual statement, showing a small balance in hand. Mr. G. T. Bethune-Baker was re-elected President, and Mr. H. Willoughby Ellis was elected President for the ensuing year; the remaining officers being as before. The following were exhibited:—By Mr. R. C. Bradley, Hymenoptera of the genus *Ammophila*, three species—*sabulosa*, *hirsuta*, and *campestris*—all from Bournemouth, where all three species occurred together last August, the two former in abundance, the latter less commonly. By Mr. Colbran J. Wainwright, rare Diptera taken in 1900; *Oxycera pulchella* from West Runton, Norfolk; *Didea fasciata* and *Melanostoma hyalinatum* from Wyre Forest. By Mr. G. W. Wynn, a long series of *Epunda lutulenta* taken at sugar in Wyre Forest last autumn; they were very constant in coloration, all being dark, but not black, specimens. By Mr. A. D. Imms, *Acronycta alni* bred from a pupa found under rotten palings between Hall Green and Solihull. By Mr. H. Willoughby Ellis, a collection of Coleoptera taken in only three hours' collecting in Bedfordshire at Christmas last; the most noteworthy capture was *Bagous cylindrus*, of which species he obtained three specimens; *Agabus nebulosus* was present in thousands in fine condition.

February 18th.—A meeting of a social character was held at the house of the President, by the kind invitation of himself and Mrs. Bethune-Baker. The members turned up in force, and very much enjoyed looking through the large collection of palaearctic and other Lepidoptera, formed in part by Mr. Bethune-Baker and in part by the late Dr. Jordan.—COLBRAN J. WAINWRIGHT, *Hon. Sec.*

RECENT LITERATURE.

VON LAGERHEIM (G.). (1900, Ent. Tidskr.; see also Bot. Centralbl. lxxxii, 334-6, and Journ. Roy. Micr. Soc. 577).

THIS paper deals with the cultivation of *Septosporium myrmecophilum* by the ant *Lasius fuliginosus*, Latr., in Sweden. "The point of interest is that the motive appears to be different from that in the other known

cases, for there is little evidence that the fungus is used to any extent as food. The ants build their nests usually of rotten wood, at times also of particles of earth, sand, &c. The particles are fastened together by means of a secretion, but the walls so formed are also interpenetrated by fungoid hyphæ, which ramify through their substance and appear to give stability to the whole. In addition to these intramural hyphæ, the fungus also appears as a down-like coating on the surface of the wall. The evidence as to intention on the part of the ants is based on the facts that the fungus occurs as a pure culture, unmixed with other genera; and that it always occurs in the nests. The purpose would appear to be to give stability to the walls, but this applies only to the intramural hyphæ; the object of the extramural coating may be to serve to some extent as food; perhaps it also roughens the walls, and so affords the ants foothold. The fungus must depend for food chiefly upon the mortar-like secretion by means of which the particles of the walls are fastened together." (Proc. Roy. Micr. Soc.).

G. W. K.

Das Tierreich. 11 Lieferung: Forficulidæ and Hemimeridæ. A. DE BORMANS and H. KRAUSS. Berlin: 1900.

In October last De Bormans and Krauss, in the eleventh number of 'Das Tierreich,' gave to the world a monograph of the Forficulidæ and Hemimeridæ. The bulk of the volume, which is a large octavo of 142 pages, in paper covers, is occupied with descriptions, together with short synonymy and habitat, of 308 species of earwigs; 31 more or less doubtful species; 20 subspecies; and one variety. These are distributed amongst thirty genera (with two more uncertain ones). We believe, however, that the work has been so long in progress that it is even now somewhat out of date. The total does not seem a formidable one for the earwigs of the whole world, though beside it the British list of eight species is meagre indeed, especially when we consider that but three of them—*Forficula auricularia*, *F. lesnei*, and *Labia minor*—can be taken naturally out in the open. The other five are, with us, dwellers within doors, as *Anisolabis annulipes* and *Apterygida arachidis*; or historical, as *Labidura riparia*, *Apterygida medii* (= *albipennis*), and *Anisolabis maritima*. For the account of the curious family Hemimeridæ, which seems to lie between the Forficulidæ and the rest of the Orthoptera, Krauss is responsible. He makes but one species, *Hemimerus talpoides*, though perhaps there is a distinct one—*H. hanseni*, both, however, being found in the equatorial regions of West Africa. The book contains a short introduction, a number of tables, and forty-seven clear outline illustrations in the text, forty-six being devoted to earwigs, and the last to *Hemimerus talpoides*. The text is in German, and is well printed by Friedländer und Sohn, of Berlin.

W. J. LUCAS.

British Flies. Vol. viii. By G. H. VERRALL, F.E.S. Pp. 1-691, with 458 text-figures. London: Gurney & Jackson. 1901.

Our author adopts the Suborders — Diptera-Orthorrhapha, and Diptera-Cyclorrhapha—of Brauer, divisions which are founded on the

form of the pupa. The volume (viii.) under notice treats of the Platypezidæ, Pipunculidæ, and Syrphidæ, three families belonging to the second suborder, and in these families the student of British Diptera will now have an authoritative guide to aid him in his work. There are tables of genera and species, and these, in conjunction with the admirable descriptions, should greatly facilitate the labour of identification of species. The bulk of the four hundred and fifty-eight excellent illustrations, from drawings by Mr. J. E. Collin, represent the more important ornamental or structural characters; full figures of the perfect insect are given of only twenty species. The matter of synonymy is critically discussed in a note, after the remarks on geographical distribution of each genus and species, and there is a full synonymic catalogue at the end of the volume.

If the succeeding thirteen volumes are to be of the same stately form as that now before us, the entire series will constitute one of the most valuable additions to British entomological literature that has been published during recent years. In his prefatory remarks with reference to the scheme of his work he says: "In default of other assistance, the author of the present volume believes himself capable of dealing with all the contemplated volumes, except those portions of vol. i. which concern the Cecidomyidæ and Sciarinæ, which will necessitate extensive biological and minute microscopical work, far beyond his available time and eyesight. If some young student will give a few years to these groups, the British Diptera may soon be as well worked out as the British Lepidoptera or Coleoptera."

We trust that there will not be any great intervals of time between the appearance of the volumes yet to be issued of this great work.

LEPIDOPTERA.—CHR. SCHRÖDER discusses the value of the male genitalia, for specific purposes, in *Eupithecia* (1900, *Illustr. Zeitschr. für Entom.* v. pp. 305-7, fig.).

NEŬKOW has experimented with the eggs and larvæ of *Pieris rapæ*, which he reared under light passing through solutions of various colours. The development was most rapid—both as a whole and in its component periods—under the influence of ordinary white light; after white light, the order of effectiveness is red, violet, green; but under the green rays the development was markedly retarded, and there was great mortality. Neither with *Pieris rapæ*, nor with *Vanessa urtica*, was any change in the coloration of larvæ, pupæ, or adults observed, as the result of development under red, violet, and green rays."—1900, *Journ. Roy. Microsc. Soc.* p. 456, abstract from 1899, *Physiol. Russe*, i. pp. 244-50.

ARNOLD VOELSCHOW records the capture, on July 2nd, 1900, in a swampy meadow in Mecklenburg Schwerin, of a male of *Argynnis aglaia*, with beautiful blue upper surface.—1900, *Societas Entom.* xv. p. 122.

H. STIZ discusses at some length the genitalia of the Microlepidoptera, Pyralidæ, Tortricidæ, Tineidæ and Butalidæ. (1900, *Zoolog. Jahrb. Anatom.* xiv. pp. 135-76; 5 plates).

The 'Entomologische Nachrichten' (1900, p. 365) announces the

publication of a new work on the Larvæ of German Macro-lepidoptera, with analytical tables for the determination of the species.—R. RÖSLER, 'Die Raupen der Grossschmetterlinge Deutschlands,' &c., with 2 plates (Leipzig, 1900, xvi. and 170 pp.).

DIPTERA.

BRUES has investigated the enormously swollen metatarsi of *Bittacomorpha clavipes*, and finds that an enlarged tracheal tube occupies almost the entire cavity. These enlargements probably enable it to be wafted about easily by currents of air, when the insect bears a striking resemblance to drifting thistle seeds. (1900, 'American Naturalist,' p. 677, ex Biol. Bull. 1900, i. pp. 155-60).

IMHOF notes three ocelli (a new feature in the family) in a Tipulid from Baden, *Trichocera*, sp. n. (Zool. Anzeiger, 1900, xxiii. p. 116).

J. C. HUBER publishes a bibliography of the Diptera, Pediculidæ, &c., parasitic on man (Jena: 4 parts, 1899-1900).

HYMENOPTERA.

W. M. WHEELER contributes two interesting papers on Myrmecophiles to the 'American Naturalist' for 1900, viz. (1) "A New Myrmecophile from the Mushroom Gardens of the Texan Leaf-cutting Ant" (pp. 851-62, 6 figs.), and (2) "The Female of *Esiton sumichrasti*, Norton, with some Notes on the Habits of Texan Ecitons," (pp. 563-74; 4 figs.).

MICHAELIS and ZANDER discuss the structure and development of the male genitalia of certain Aculeata (1900, Zeitschr. für Wiss. Zool. lxvii. pp. 439-60; 1 plate (Michaelis), pp. 461-89; 1 plate and 9 figs. (Zander).

C. EMERY revises the nomenclature of the parts of the thorax in Formicidæ (1900, Bull. Soc. Ent. Ital. xxxii. pp. 103-19, figs. 1-14).

GENERAL.

L. B. WALTON discusses the structure and formation of the basal segments of the leg in Insecta. He summarises his conclusions as follows:—

In Hexapoda the "coxa" is composed of two more or less fused segments, "coxa genuina" and "meron." The antecoxal piece results from the chitinization of the membrane connecting the coxa with the sternum. The trochantin probably originated from a lateral portion of the same membrane. Audouin erroneously homologized the lateral margin of the posterior coxa in *Dytiscus circumflexus* with the trochantin of the prothorax and mesothorax. The trochanter represents a distinct segment of the legs. The meron and coxa genuina, together with their corresponding basal segments, epimeron, and episternum, give evidences of a fusion between two primary metameres. The anterior metamere bears the functional, and the posterior the rudimentary leg. Of the primitive Hexapoda, Neuroptera Planipennia exhibit the most generalized condition in the development of the coxa, while in Thysanura and Orthoptera a high degree of specialization is shown.—"The Basal Segments of the Hexapod Leg," in 'American Naturalist,' 1900, xxxiv. pp. 267-74; 6 figs.

THE ENTOMOLOGIST

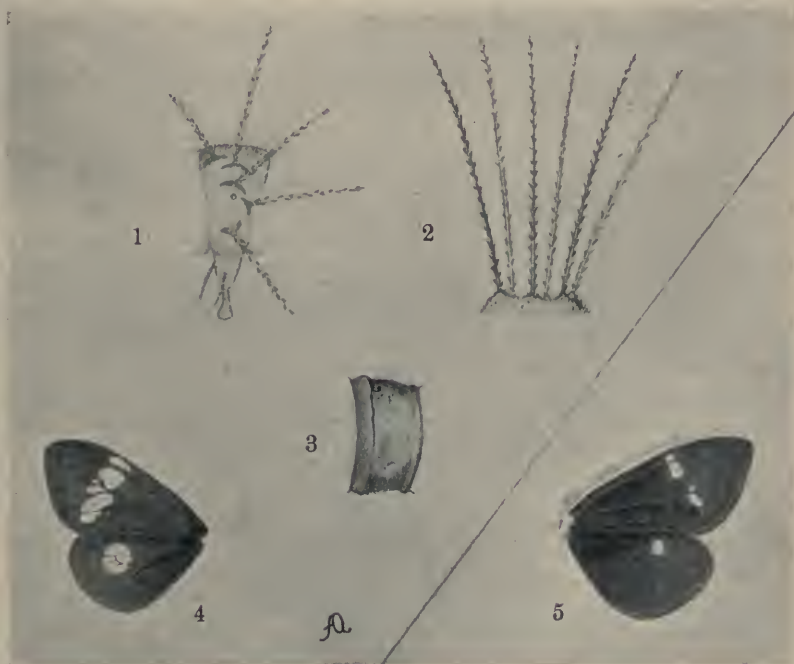
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NYCTEMERA ANNULATA, Boisd., OF NEW ZEALAND: LIFE HISTORY.

BY AMBROSE QUAIL, F.E.S.



NYCTEMERA ANNULATA.—Fig. 1. Third abdominal segment of newly hatched larva, enlarged $\times 200$. Fig. 2. Supra-spiracular tubercle after first ecdysis, enlarged $\times 200$. Fig. 3. Sixth abdominal segment of pupa, enlarged. Fig. 4. *Nyctemera secundiana* of Queensland, nat. size. Fig. 5. *Nyctemera annulata* of New Zealand, nat. size.

This Arctid-Hypsid is very plentiful in New Zealand, and, according to authors, is endemic; but "two closely allied species belonging to the same genus are found in Australia." I believe no detailed life-history of either species has been published, and this paper may interest some entomologists to compare with the more or less allied *Arctia caia*, as set forth in Dr. Chapman's elaborate paper (Entom. Record, vols. iv., v.).

OVUM.—During the month of March, 1900, I procured several batches of ova from wild females; though some were laid loosely, others were deposited in regular order, in fact in hexagonal order. The ovum is globular, a little flat on the attached surface; colour yellowish, and the opaque highly polished surface is covered with a very fine hexagonal pattern. The ovum becomes transparent and black a short time before hatching; it hatches in nine days; the empty egg-shell is eaten by the newly hatched larva.

The young larvæ eat the under side of the leaf in patches; they do not eat right through the leaf, but leave the thin upper epidermis. One larva ate right through the leaf while in its fifth skin, but it seems to be in the last skin preceding pupation when they eat through the leaf as a regular proceeding.

LARVA (newly hatched).—Head dark brown, remaining segments pale in colour; the tubercles and setæ soon become brown, but the spiracles remain pale-coloured. Viewed from above the segments have a lumpy appearance, post-trapezoidal and supra-spiracular tubercles being on conspicuous swellings. The whole larva-skin is covered with minute hairs, and nearly all the setæ of tubercles are spinulose; the structure of the setæ is exactly the same in newly hatched and adult larvæ. Head has more than a dozen hairs on each lobe, six hairs on clypeus; the hairs of the head are smooth. Antennæ are broad at base, narrow middle joint, wider outer joint terminated by three fleshy processes and a bristle. Spinneret short. Prothorax: the dorsal plate has a rounded posterior, is dark in colour, and at either side of the mid-dorsal line are two remote anterior setæ and two remote posterior setæ, which form a transverse diamond pattern; below the plate a subdorsal tubercle has two rims (? with pale smooth hairs); a mid-lateral tubercle bears two setæ; posterior to this is the spiracle; above the leg a large tubercle bears two setæ. Meso-thorax: a large dorsal tubercle on either side of mid-dorsal line bears three setæ arranged triangle pattern; a small subdorsal tubercle bears one pale smooth seta; an anterior lateral tubercle bears one seta; the leg tubercle bears two setæ. Post-thorax: dorsal tubercles bear three setæ arranged in transverse line, otherwise the details are as meso-thorax. All the thoracic legs have smooth hairs at the joints. Abdomen: the anterior trapezoidal tubercles are close together, post-trapezoidals remote, one seta each; the supra-spiracular tubercle bears one seta, and is anterior to the post-trapezoidal and immediately above the spiracle; the subspiracular tubercles are well below the spiracle, remote from each other, and bear one seta each. Segments 1, 2 have two subventral setæ, these are on the base of abdominal feet of seg-

ments 3, 4, 5, 6. Segments 7, 8 have one subventral seta each. Segment 9 has the position of the trapezoidal tubercles reversed; one subventral seta. Segment 10 viewed laterally has two dorsal tubercles and two subdorsal, with one seta each; there are three setæ in the region of base of claspers. The abdominal feet and claspers are cone-shaped at the base, sticking out of which a pedicel or stalk with a broad end has a few terminal hooks. Ventrally the abdominal feet have a seta on the inner side, and corresponding setæ are on the footless segments.

Five days old (first skin full fed).—Length just prior to ecdysis $\frac{3}{16}$ inch; larva is much distended, and has lost the lumpy appearance. Head: dark brown. Prothorax: dorsal plate very dark brown, segmental area white. Meso-thorax: mottled red longitudinally between dorsal and subdorsal tubercles. Post-thorax: the red extends above dorsal and below subdorsal tubercles; segmental area yellow. Abdominal segments are yellowish white, with reddish colour enclosing the post-trapezoidal and supra-spiracular tubercles, connected dorsally posterior leaving anterior trapezoidals on a median patch of yellow colour; transverse mottling connects the supra-spiracular and sub-spiracular tubercles.

Eight days old (second skin).—Length about $\frac{3}{16}$ inch. Similar marking to prior to ecdysis. Head shining black. Pro- and meso-thorax white. Abdominal segments are yellow: between the tubercles transversely the colour is brown connected dorsally. Spiracles brown. Setæ shining brown; all segments appear to be the same size; larva robust. Head: all hairs are smooth. Prothorax: scutellum at either side has an anterior series of five setæ and two posterior setæ. A small subdorsal tubercle bears two hairs, large lateral tubercle about six setæ; posterior to this is the spiracle; below the spiracle a large tubercle bears about nine setæ. Meso-thorax: large dorsal tubercles, one at either side of mid-dorsal line, bear about fourteen setæ; a small subdorsal tubercle has one hair; large mid-lateral tubercle bears nine setæ; a large tubercle above legs bears about nine setæ. Post-thorax as meso-thorax. All the thoracic legs have spinulose setæ at the joints. Abdomen: the anterior trapezoidal tubercles are minute, with a single spinulose seta each; post-trapezoidal tubercles are mid-dorsal at either side with six setæ each; supra-spiracular tubercle (subdorsal) are very close to post-trapezoidals, but moved a little forward; these have seven setæ. The spiracle is anterior below the supra-spiracular tubercle; two large tubercles, one below the other under the spiracle, bear eight setæ each. It is difficult to make sure of the tubercles, owing to the numerous setæ. Segments 1, 2, 7, 8 have a small subventral tubercle with four setæ (short). Segments 3, 4, 5, 6 have corresponding tubercle at base of abdominal feet, which are also covered with numerous short spinulose setæ. Segment 9 has a very large subdorsal tubercle with about seventeen setæ; lateral tubercle with about eight setæ, and subventral tubercle with four setæ. The ventral tubercles have about five setæ each, and the abdominal feet have numerous spinulose setæ all over inner side. Terminal hooks are only on inner side of the abdominal feet. The whole larva-skin is covered with fine hairs.

The complete change after first ecdysis to tubercle structures with many setæ is of great interest. The tubercles are elevated cushions which form a common base for the setæ. Dr. Chapman details similar alteration from tubercles with single setæ in first skin, to tubercles with numerous setæ in *Arctia caia*; in the latter species, however, the supra-spiracular tubercle bears two setæ in first skin.

It is unnecessary to detail the structure in each skin; I noted in third skin that the 10th abdominal segment has two dorsal tubercles with numerous setæ. In succeeding skins the tubercles become more setiferous, and the colour and markings tend to that of the adult larva. I counted on the abdominal post-trapezoidal tubercles twenty setæ in the sixth skin. The skins were changed at 13 days old, to third skin; at 20 days old, to fourth skin; at 30 days old, to fifth skin; at 45 days old, to sixth skin.

Immediately after change into sixth skin the larvæ went into hybernation. Three larvæ hybernated on the side of a glass jar, and never moved until near completion of hybernation; they remained close to the cast skins. One larva hybernated in its fifth skin, but was restless, and wandered about on warm days; it changed its skin in about a month, and then settled down quietly. One larva I suspect had not changed its skin, and remained always more or less restless, and would not feed. One larva was in its first skin (hatched same time as the others) when the others went into hybernation; this simply became defunct. The normal position of the larvæ in hybernation is head downwards. Only two larvæ recommenced feeding after hybernation, the others appeared too weak to do so, and although they wandered over the food, they did not eat, but died off. The hybernating period lasted 126 days.

At 19 days after hybernation = 190 days old, change to seventh skin. At 202 days old, change to eighth skin. At 214 days old, one larva commenced to make shroud in which to pupate. At 215 days old the shroud, or loose horizontal cocoon similar to that of *Arctia caia*, was completed; a quantity of broken setæ are intermixed with the threads. The larva became much contracted, rested on its dorsum within the cocoon, and turned to pupa during the morning at 216 days old.

Seven days later the second larva pupated; at the same date wild pupæ could be obtained; and five days after this I observed the first wild imago; and on subsequent days others were noticed. My friend Mr. A. Bacot describes the tubercle setæ of certain Liparid larvæ as having a bulbous swelling, and that *Lithosia complana* and *L. griseola* also have similar setæ (Entom. Record, vol x. 74). I carefully examined the setæ of *Nyctemera annulata* for this form of seta, but such was not present; those setæ which are not spinulose throughout their length are simple, i.e. smooth as mentioned.

PUPA.—Length $\frac{5}{8}$ inch, at widest nearly $\frac{1}{4}$ inch. The ground colour is black; there is a slight brownish tinge on some; one specimen has the wing-cases almost wholly yellow, but normal specimens have only the nervures of a yellow colour. Some yellow spots on the abdominal segments form three longitudinal lateral series, and two ventral series, and one mid-dorsal. The shape is robust, thickest at 3rd abdominal segment. The head is ventral, meso-thorax swollen anteriorly, and a waist is formed dorsally at the juncture of post-thorax and 1st abdominal segments. The wing-cases extend to the ventral posterior edge of 4th abdominal segment. Spiracles are conspicuously elevated, position on 2nd abdominal being almost dorsal; 3rd subdorsal 4, 5, 6, 7, 8 normal. The abdominal incisions are distinct and sharp; anterior edge of segments has a flat sloping rim, and all, except the posterior fixed segments, are covered with innumerable minute pits (only distinguishable under microscope, and probably associated with the fine larval hairs). I cannot detect setæ (corresponding to tubercle setæ of larva). The terminal segment is round and blunt; the anal armature consists of two sets of hooks, twelve each, at either side of the dorsal posterior extremity. Dehiscence: dorsally split down middle of meso-thorax and post-thorax, and transversely at suture of same; the headpiece, with eyes, legs, and antennæ intact, separates from costal edge of the wing-cases, except at their tips.

The first imago, a male, appeared after thirty-two days in pupa. Second imago, a female, appeared five days later, after a period of thirty days in pupa. Thus, from May 10th, 1900, when the ova were deposited, to November 23rd, 1900, when the male emerged = 257 days, of which 126 days were passed in hybernation. Wild imago females of *N. annulata* continued to deposit ova right up to the time that my larvæ went into hybernation, but I have little doubt that the progeny from these never pass through the winter, and that the race of *N. annulata* is maintained by those individuals which succeed in attaining at least the sixth skin before winter.

So far as I can learn, thanks to the kindness of Mr. R. Illidge, of Queensland, *Nyctemera secundiana* is more closely allied to *N. annulata* than any other species; it is interesting to observe in the latter the decrease in size of the white wing-marking—indeed, I have one specimen, sent by Mr. G. Howes from the extreme south of New Zealand, in which the white spot of the hind wings is almost obliterated. I have little hesitation in believing that *N. annulata* of New Zealand has been directly derived from the Queensland species *N. secundiana*.

Palmerston North, New Zealand: Jan. 22nd, 1901.

MARGINAL WING-BRISTLES IN LEPIDOPTERA.

BY PROF. C. H. FERNALD.

In the February number of this Journal (*ante*, p. 47), Mr. Ambrose Quail gives an illustrated article on the above subject, and states that he has read a great deal that has been written in reference to wing-structure in the Lepidoptera, but finds no reference to the presence of erect marginal bristles at regular intervals on the wings of certain Lepidoptera.

I have figured and described these bristles in two different works—'The Crambidae of North America,' p. 10, plate A, fig. 11 (1896); 'The Gypsy Moth,' p. 341, plate 52, figs. 8 and 9 (1896). I have observed these spines in the wings of many of the Lepidoptera, and have never examined the wings of any Lepidopterous insect without finding them. I should therefore be surprised if they are not found in all the species of this order.

They are not always curved as shown in Mr. Quail's illustration; but, while some are curved, others on the same wing are straight, as those figured in the Gypsy Moth, mentioned above, which under high powers of the microscope appeared to be hollow, with a minute opening at the outer end. While I do not feel like expressing a positive opinion as to their function, I had supposed that they might be connected with scent glands beneath, or that they might be sense organs of some kind, and that the two circles near the end of each vein, which are more easily seen than these spines, are also sense organs.

I have less doubt about the function of the spiny area near the base of the under side of the hind margin of the fore wings of many (not all) Lepidoptera, and also in a few species in other orders. A good account of this area and its function may be found in 'Psyche,' vol. vii. p. 395, pl. 9 (1896).

Amherst, Mass., U.S.A.

DESCRIPTIONS OF FOUR NEW SPECIES OF *DISONYCHA*.
(COLEOPTERA PHYTOPHAGA, FAM. HALTICIDÆ.)

BY MARTIN JACOBY, F.E.S.

DISONYCHA FLORIDANA, sp. n.

Head fulvous; antennæ (the basal joint excepted), the tibiæ, tarsi, and the breast black; thorax impunctate, pale fulvous, margined with flavous; elytra punctured near the suture with five more or less distinct longitudinal costæ, pale fulvous, with a subsutural and a submarginal narrow flavous stripe joined at the apex. Length $5\frac{1}{2}$ millim.

Head impunctate, fulvous, the anterior portion paler, the frontal elevations flat and but feebly raised, clypeus broad, labrum and palpi

black; antennæ scarcely extending to the middle of the elytra, black, the basal two joints (sometimes) flavous; the fourth and fifth joints equal, longer than the third; thorax more than twice as broad as long, the sides feebly rounded, with a narrow margin, the anterior angles obtusely rounded, the posterior ones oblique, the disc with an obsolete transverse sulcus near the base, impunctate, pale fulvous, all the margins narrowly flavous; elytra with a few fine punctures near the suture, the rest of the surface impunctate, with five more or less distinct longitudinal costæ, the first and the fourth pale flavous, the lateral margins and the elytral epipleuræ of the latter colour; the breast and the basal segments of the abdomen black, the others flavous; the femora fulvous; the tibiæ and tarsi black.

Hab.—East Florida, St. John's Bluff.

This species, of which two exactly similar specimens are contained in my collection, does not seem to have been known to Dr. Horn, who published a "Monograph of the North American Halticidæ" (Trans. Am. Ent. Soc. xvi. 1889). *D. pensylvanica*, Illig., seems the most nearly allied species, but differs totally in the coloration of the head, the elytra and under side, and in the want of the elytral costæ. *D. costipennis*, Jacq. Duval, from Cuba, seems to agree in the costate elytra with the present insect, but the author says nothing of the pale thoracic margins nor elytral bands, nor does Suffrian, who had seven specimens of the last-named species before him, mention this character, although he gives a detailed description of the Cuban insect. I must therefore consider this well-marked American form as new.

DISONYCHA ARGENTINENSIS, sp. n.

Flavous; head and antennæ black; thorax flavous, closely and strongly punctured; elytra nearly impunctate, black, a subsutural and sublateral posteriorly united band flavous; the breast, the knees, the apex of the posterior femora, and the tarsi black. Length 5 millim.

Head deeply rugose-punctate, black with æneous gloss; antennæ short and stout, black, the basal two joints more or less stained with flavous; thorax twice as broad as long, the lateral margins feebly rounded, the anterior angles slightly produced outwards but not pointed, posterior margin oblique at the angles, the surface closely and strongly punctured, flavous, the punctuation partly confluent at the sides; scutellum broad, impunctate, blackish æneous; elytra extremely finely punctured near the base and suture, the rest of the surface nearly impunctate, black, with a narrow subsutural and submarginal flavous band joined at the apex, below flavous; the breast, the knees, the extreme apex of the tibiæ, as well as the tarsi, black; the posterior femora also with a black spot at the apex; the abdomen sparsely clothed with pale pubescence.

Hab.—Argentine R.

There are four specimens of this species before me which differ from any of its nearly similarly coloured allies by the rugose sculpture of the head and the close and strong punctuation of

the thorax; the flavous elytral bands are about half the width of the discoidal black vitta, in which respect the species somewhat resembles *D. glabrata*, Fab. In two of the specimens this black intermediate band is emarginate at its outer margin, but no other differences are to be found. If the flavous colour of the elytra is taken for that of the ground colour, the latter may be described as having a narrow sutural and lateral black margin and a discoidal broader black band not reaching to the apex.

DISONYCHA LABIATA, sp. n.

Broadly ovate, fulvous; the antennæ, the labrum, breast, the tibiæ, and tarsi black; thorax impunctate; elytra scarcely perceptibly punctured, pale fulvous, a narrow sutural and submarginal stripe, joined at the apex, and a broader discoidal one not extending to the latter, black. Length 7 millim.

Head impunctate, with the exception of a punctured impression near the eyes, fulvous; the extreme vertex sometimes black; frontal tubercles obsolete; clypeus triangularly thickened with a small fovea above its base; labrum black; antennæ rather slender, black, the joints, with the exception of the small second one, elongate, the third slightly shorter than the fourth joint, the basal one more or less fulvous; thorax distinctly narrowed anteriorly, scarcely twice as broad as long, the sides rounded, narrowly margined, the anterior angles slightly oblique, not produced, the surface entirely impunctate, rather convex; scutellum black; elytra very minutely, sometimes scarcely perceptibly punctured, convex, the suture of each elytron and a longitudinal stripe close to the margins very narrowly black, joined at the apex, the middle of the disc with a broader band, not quite extending to the apex; below fulvous, rather densely clothed with grey pubescence; the breast fuscous; the extreme apex of the femora and the tibiæ and tarsi black.

Hab.—Mexico.

Of this species I have lately received two exactly similar specimens without detailed locality which do not agree with any of those described by me in the 'Biologia Centr.-Amer.,' nor with those described previously. The insect seems to be intermediate between *D. carolianna*, Fab., and *D. crenicollis*, Say. It differs from the first-named in the black labrum (always pale in the allied species), in the unspotted thorax, and in the black tibiæ; from *D. crenicollis*, with which the species has the black labrum in common, it differs in the width of the discoidal black band, which is distinctly narrower than the fulvous portion, not as wide or wider, as Dr. Horn gives as one of the distinguishing points; there is also an absence of the three black thoracic spots in the present species.

DISONYCHA VENEZUELÆ, sp. n.

Elongate and parallel, black; thorax closely and finely punctured, fulvous, with a transverse black band; elytra extremely closely punc-

tured, black, with a subsutural and submarginal fulvous slightly raised band, joined at the apex. Length 7 millim.

Head closely punctured, with a smooth narrow central line; frontal tubercles distinct; antennæ extending nearly to the middle of the elytra, black, the lower three joints more or less fulvous below, terminal joints shorter than the intermediate ones; thorax twice as broad as long, narrowed in front, the sides rather strongly rounded, narrowly margined, the anterior angles not produced, the surface reddish fulvous, with a broad transverse black band at the middle, not quite extending to the lateral margins, this band closely and finely punctured, the fulvous portion nearly impunctate; scutellum much broader than long, black, impunctate; elytra extremely closely and distinctly punctured, black, with two narrow dark fulvous bands, one near the suture and about as wide as the black sutural interstice, the other near the lateral margin, of the same width and joined at the apex to the subsutural band, both these bands are somewhat convex or semicostate; the elytral epipleuræ, the entire under side and legs black, finely clothed with grey pubescence; the flanks of the thorax and the prosternum fulvous.

Hab.—Venezuela.

The thoracic black and closely punctured band, the very close punctuation of the elytra and the semicostate fulvous bands will distinguish this species (of which three specimens are before me) from any of its congeners.

ON THE MORPHOLOGY AND CLASSIFICATION OF THE AUCHENORRHYNCHOUS HOMOPTERA.

BY DR. H. J. HANSEN.

(Continued from vol. xxxiii. p. 334.)

The Cercopidæ thus differ by the metasternum, by the form and articulation of the posterior coxæ (partly also by their size), by the quality of the articulation between the trochanters and femora, and by the presence of the femoral protuberance just mentioned—from the following and preceding families, and they form in many respects a transition between them and the extremely remarkable Fulgoridæ.

3. *Jassidæ*.—The metasternum is *strongly chitinised*, and forms merely a narrow transverse belt, except at the middle line, where it sends a longitudinal narrow plate backwards between the posterior coxæ. These are *very large*, and their articulation extends right across to the lateral margin of the body, and nearly to the middle line. Their free distal part is proportionately moderately short, and directed downwards, backwards, and towards the middle plane, so that the interior angles of the two coxæ approach together in the middle line; the trochantins are

of considerable size; *the coxal movements are similar to those in the Stridulantia*, and there is no meracanthus. The trochanters are supporting, and the movements between them and the femora are not so altogether feeble. The femora present nothing distinctive.

4. *Fulgoridæ*.—The metasternum (pl. ii. f. 6) has a *considerable length in the direction of the insect's longitudinal axis*, and is (with the exception of a small somewhat firm plate (b¹) anteriorly in the middle and a narrow transverse strip, which is partly covered by the middle coxæ, along the anterior margin) *completely membranous (b) right up to a small space from the insect's lateral areas*; while the latter (c), which are bent somewhat inwardly and ventrally, are strongly chitinised. The posterior coxæ are most nearly contiguous at the middle plane of the insect, and are inserted as far back as possible on the metathorax; so that, in spite of their feeble extension in the direction of the insect's length, they reach somewhat backwards over the base of the abdomen, whose ventral surface lies in a plane which, seen from below, is considerably lower than that of the metasternum. The coxæ are contiguous anteriorly with the metasternal membrane, but laterally they are limited by firm chitin (7a), with *which they are consolidated* so intimately, that a true separating suture has disappeared, and one can at most find only a feeble furrow (b). The presence of a more or less developed meracanthus (7d), and a comparison with the structure in the Cercopidæ, make it clear that the coxæ extend out to a shorter distance from the lateral margins of the insect. (The whole structure of the coxæ and their attachment are, moreover, so different from other Auchenorrhyncha, that I do not see my way to elucidate all the questions hither appertaining. A large prolongation of the coxal chitin is thus continued forward and somewhat outward within the interior of the metathorax, but the significance of this is unknown to me.) The trochantins I have not been able to discover. The trochanters (fig. 7e) *are short and much thicker, up to twice as thick as the femora*; their movements with the coxæ follow a very exact and precise plan, but the axis is sometimes (as, for example, in *Fulgora*) nearly perpendicular to the body, sometimes more oblique; movements in the given plane are very large, and the connecting membrane facing the middle line has an extraordinary breadth, which is easily seen, for example, in *Fulgora*. The articulation between the stout trochanters and the femora (g) differs very much from the condition in other Auchenorrhyncha, *for they admit of a by no means feeble movement in several directions*. The femora are almost equally stout everywhere, and *near the base one finds on the dorsal side an oval or rounded, bright whitish or yellowish spot (f. 8a)*, which is somewhat convex, sharply limited, and whose outer chitin-layer shows, seen with about 600 diameters, a

peculiar punctured and rugulose appearance. I have made further researches on the structure of an alcoholic example of *Calyptoproctus stigma*, Fabr., and found that the usual chitinous skin of the femur at that place where the spots occurred was darker than its environs, solid, and punctured in like manner, and that the substance which formed the bright spot situated on the skin could be cut off as slices, and resembled chitin of a peculiar loose and tolerably soft consistency. This would indicate that that spot is a peculiar organ, but its nature is quite enigmatical to me. Spots of this nature are found in *all* the Fulgoridæ examined by me, and they are usually easily enough discernible with a lens on dried specimens when the abdomen is raised somewhat upwards, or the posterior femora turned somewhat downwards. The presence of this may be considered a good family character.

The posterior coxæ are, as has been said, *immovably fixed to the metathorax*, but the circumstance that the metasternum nearest to it is entirely membranous, and that the extent of the coalescence between the posterior coxæ and metathorax is proportionately somewhat short, allows, it would seem, a certain elasticity.

The largest and most powerful movement of the legs originates from the articulation between the coxa and trochanter, and as the insects—as is well known—can leap, one would expect to meet with strange modifications of organization; and one really finds that there projects forward from the inner side of the trochanter a *powerful tendon* (pl. ii. f. 7f) *terminating in an exceedingly large, flat, plate-like bowl* (f¹), which receives the obliquely forward and somewhat outwardly directed *adductor muscle* (which is often visible through the metasternal articulation, and astonishingly strong), the contraction of which certainly produces the spring. (In the other saltatory Auchenorrhyncha, one finds, as was to be expected, the same muscle with the tendon and its dilatation, but not so powerfully developed.) The uncommonly free movements between the trochanter and the femur may thus surely enough, in part at least, both fill their usual rôle, and at the same time compensate for the movements lost on account of the firm fixation of the coxæ, for the legs can, as a matter of fact, serve for leaping and walking, or clambering upon plants, and the movements of the femora in one single plan, resulting from the fixed segment-axis in the articulation between the coxa and trochanter, are scarcely sufficient for these purposes.

2. Tarsi.

These are, as is well known, always trisegmentate, except in a few Stridulantia, where the number of segments is reduced to two. The tarsi are always terminated by two equal claws, which I have always found to be simple, without teeth or other

peculiarities. Furthermore, it is well known that an empodial formation exists in all families except Stridulantia.

This empodium is, what has apparently hitherto escaped notice, differently formed in these families. And, first of all, I may say that I have never found fastening-hairs on the empodia; and that in the same insect these are essentially similar in all three pairs of legs. For practical reasons, I describe the tarsi of the Jassidæ before those of the Cercopidæ.

1. *Jassidæ*.—The empodium is *always firmly fixed to the inner surface of the claws out to a short space from or even more nearly out to their apices, while its free terminal margin is always deeply incised* in the middle line (pl. ii. f. 9, tarsus of *Ledra aurita*; f. 10, of *Ulopa reticulata*; f. 11, of *Membracis tectigera*). From observations upon dry specimens with a lens, one receives, as a rule, the decided impression that the empodium forms a thicker rampart along each claw from base to close out to its apex, and that between the claws it is cleft close to the base; this form is fundamentally different from that which one observes in dried Fulgoridæ (see below). On account of the contraction caused by the shrinkage in drying, the cleft appears in dried specimens to be very much stronger than it actually is in fresh material; but, when treated with potash, the empodia regain practically their proper form as they are represented in my figures. In the forms examined by me the empodia have at the middle, or towards the base, two short and broad, or long and narrow, somewhat firmly chitinated plates (ff. 9 and 11 l) on the upper surface, the rest of which is for the most part, or totally, membranous; the under surface is membranous, and does not possess longitudinal plates or the processes occurring near the outer angles of the empodia in the following family.

2. *Cercopidæ*.—In these the empodia are proportionately thicker and more substantial than in the Jassidæ; in many, and especially in larger forms, they are united with the inner surface of the claws for a good half of the length of these; in others the connection with the claws extends out to a little way from the apex of the latter, and in these forms they are very strong and thick. In a softened and distended state their apical margin often reaches out a good way beyond the claws (pl. ii. f. 12), but this margin is, contrary to its state in Jassidæ, not sharply nor deeply incised, *but entire or somewhat emarginate*. The upper surface is towards the base occupied by a triangular chitinous plate (12 l), which is more or less membranous along the middle line, and which manifestly answers to the two separated plates in the Jassidæ. Exterior to this plate one (always ?) finds in the middle line a peculiar bristle (g), consisting of a thicker cylindrical basal part, and, jointed to this, a bristle-shaped terminal portion along the under side (12 a, b) runs close to the lateral margins, a firmly chitinated setiferous band; similar

setæ were found in *Ledra*, but in this form the darker coloured bands were wanting (m). In all the forms examined with the microscope (see enumeration at the observations on antennæ) a peculiar process (n) is found, projecting somewhat from the inner surface of the claws at the place where their connection with the empodia terminates. This process—which is generally firmly chitinated, sometimes, however, slight and feeble, but always furnished with small chitinous bristles—is not firmly united to the claw, and appertains decidedly to the empodium, although, seen in profile, it usually resembles a tap (or stopple) from the inner margin of the ventral part of the claw. These processes are easily seen in many dried examples of exotic Cercopinæ and Aphrophorinæ, but in several forms I have not been able to detect them with certainty, and I have no very precise opinion whether they are then actually lacking, or (as in *Philænus spumarius*) only very small and feebly developed. The tarsi of *Machærota*, which have been examined with a lens, seem to accord with the other Cercopidæ.

Family-characters, therefore, may be stated thus :—*The empodia are very thick, united with the claws for a considerable, or very considerable, part of the length of the latter, their free apical margin is not properly incised, and on their under side are seen two firm longitudinal bands.*

3. *Fulgoridæ*.—In *Fulgora* the empodium, seen from above (f. 13), is short, almost rectangular, oblique, partly somewhat firmly chitinated, and is only united with the claws closely around their base, and for the rest projects freely forward between them. In *Calyptoproctus*, *Dictyophara*, *Cixius*—and the *Delphax* group (f. 14) and *Pæcilopectera* (f. 15) the empodia are notably stoutly formed (strongest in the two last named types), and project for some distance forwards between the claws, but are only united with these for a shorter (not nearly half the length of the claws), or very short, space, and may be either (*Megamelus*) considerably—somewhat diffusedly—chitinated, or, on the contrary (*Pæcilopectera*), entirely membranous with a couple of small chitinous strips out near the margins on the upper side. In *Tettigometra* (f. 16) they are entirely membranous, and reach, seen in profile, out to a trifle from the apices of the claws; seen from above, however, they are united with the inner margin of the latter, only for somewhat over half of their length. In *Calliscelis** they reach, when the tarsi with extended claws are

* In this form the basal segment of the posterior tarsi is strongly dilated, and the under surface partly beset with peculiar bristles (pl. ii. f. 17 b), many of which are flattened, spatula-shaped, with rounded-off ends; while others are longer, pointed, and somewhat flattened out. These do not appear to be fastening-hairs of the quality which are found, for example, on the tarsus of Cerambycidæ. Some dilation is also seen in the middle segment of the tarsus. Similar tarsal structure has been also observed in *Eurybrachys*.

examined from above (f. 17), even much beyond the apices of the latter, but it is evident too that their edges at the angles incline very strongly around, so that the real union with the claws takes place farther back, and at least their *apical third is free*. The empodium has on its upper surface two stout chitinous plates, on the under surface (f. 17a) two bristles. In *Issus* a similar structure is observed; more than half of the claws, however, are in this case free.

To summarize: *at least the exterior third and generally more, or considerably more, than one-half of the claws are free, without union with the empodia, which with a free portion extend anteriorly between them, and whose free apical margin is rounded, truncated, or at most slightly emarginate, never more deeply incised. Even in dried specimens these characters—peculiar to this family—are usually easily discernible.* I have not found chitinised bands on the under side, nor a process at the apex, as in the *Cercopidæ*.

(To be continued.)

A PRELIMINARY LIST OF THE LEPIDOPTERA OF WEI-HAI-WEI.

BY THOMAS BAINBRIDGE FLETCHER, R.N., F.E.S.

ON the 24th of May, 1898, the Union Jack was hoisted at Wei-hai-wei, which from that date, though nominally "on lease," has practically been a British colony. The principal feature of our new possession is Leu-kung-tao, or the Island of Leu-kung, lying roughly east and west, some three and a-half miles long by a mile in extreme breadth, and rising to 600 ft. (Centurion Hill) at the western end. The north side is steep and abrupt, but the south side slopes down more gradually and overlooks the harbour of Wei-hai-wei, which is some two miles across. On the further side of the harbour is the mainland, sweeping in a curve around the whole southern side of the island; it is for the most part hilly, the highest point (Mount Goschen) rising to about 1800 ft. The hills themselves are mostly rather bare, covered with loose jagged boulders, and scantily clothed with grass and a few small bushes; but their slopes support a more luxuriant vegetation, consisting of small firs and dwarf oaks, whilst in the valleys willow and alder are plentiful. Nearly all the fairly level ground is under cultivation. There are few flowers, and this fact, with the absence (except for a few willows) of trees of any size, gives the country, at first sight, a rather dreary and barren appearance. The climate is milder than at Peking, the summer temperature only for a short time exceeding 80° F. The rainfall during the

summer is almost entirely in July and August, the remainder of the period, from March to November, being dry and sunny.

Chifu (Chefoo) is some forty miles along the coast to the westward of Wei-hai-wei, and is so similar in physical and faunistic features that I have included captures made there in the present list.

Wei-hai-wei seems to be well within the Palæarctic Region, the Oriental Region not extending north of the Chusan Islands on the mainland, though there is a considerable admixture of Oriental with Palæarctic forms in the south of Japan.

The periods during which I was at Wei-hai-wei or Chifu were April to July, October and November, 1898; 19th April to 20th June, 1899; and 26th September to 13th October, 1899. Most of my collecting was done in Leu-kung-tao, and on the mainland around "Flagstaff Camp" (the nearest point to the island) and the walled city of Wei-hai-wei, which gives its name to the district, and on the slopes of Mount Goschen at the back of Flagstaff Camp. If anyone were to reside on shore with opportunities for night-work, the list of moths would almost certainly be increased to five or six times its present dimensions. Indeed, I myself have some thirty or forty additional species, which I was unable to identify during my brief stay in England.

The identifications were made in most cases from specimens in the National Collection, and I have to thank Dr. A. G. Butler, Mr. W. F. Kirby, and Mr. F. Heron, for their kind assistance in naming my captures.

RHOPALOCERA.

Fam. NYMPHALIDÆ.

Sub-Fam. NYMPHALINÆ.

Argynnis adippe, L.—Occurs abundantly from June to September; I have found it as early as 27th May and as late as 16th October. It has a great liking for tall flower-heads, especially thistles, and it is a fine sight to watch them sail from flower to flower, now exhibiting their tawny velvet markings, and now flashing their silvery lustre in the sunshine. The type, as we know it in Europe, does not seem to occur, the specimens ranging from var. *coredippe*, Leech, to var. *nerippe*, Felder; this latter is often reckoned a distinct species, but I prefer to consider it here as a form of *adippe*. Some of the females, taken in July, are very dark, and look quite black when on the wing.

Polygonia c-aureum, L.—Worn specimens are fairly common in April, but I have seen none in the autumn.

Pyrameis calirrhœ, Fb. (= *indica*, Herbst.).—Moderately common on the mainland hills in May and June; I have seen none in autumn. Apparently does not occur in Leu-kung-tao, as it is essentially a hill species, rarely descending below 1000 feet.

Pyrameis cardui, L.—Abundant all the fine weather—May to October. Especially fond of hill-tops.

Hestina assimilis, L.—Occurs on the mainland hills in June and July, but is not very common.

Sub-Fam. SATYRINÆ.

Pararge (Crebeta) deidamia, Ev.—Common in the hills, being especially fond of a bare hill-side strewn with fragments of rock. Appears in May and again in August, being double-brooded. The usual form is darker than the type, and some have the ocelli distinctly blue instead of white. The egg is perfectly globular, and of an opaque, very pale greenish-white colour.

Ipthima sp.—One specimen seen on the mainland, 18th June, 1898.

Cænomypha amaryllis, Cram.—Common in June and August, being double-brooded.

Eneis mongolica, Oberth.—Very local. Four females on the mainland, 25th April, 1899, on a hillside covered with stones and coarse grass. They are more strongly marked than in the type. This seems rather a scarce species; it was discovered by the Abbé David in Eastern Mongolia, where it flies in summer on mountains at an altitude of five hundred metres. My specimens, however, were taken at a height of only two or three hundred feet above sea-level.

Fam. LYCÆNIDÆ.

Sub-Fam. LYCÆNINÆ.

Thecla micans, Brem.—One specimen (Leu-kung-tao, 20th July, 1898) intermediate between the type and var. *betuloides*. Two specimens of var. *betuloides* in Leu-kung-tao, at the beginning of June, 1898, flying amongst oak-bushes. Type itself not found. In life, the tails so exactly resemble antennæ, and the anal ocelli so well reproduce the head, &c., that at a cursory glance we can hardly see which is the head. This is probably of protective value, as it might well puzzle a foe such as a lizard.

Amblopalus avidienus, Hewits.—Fairly common on the mainland, 25th April, 1899, flying over dwarf oaks. Very hard to catch, and apt to beat itself to pieces in the net. The under side seems beautifully adapted to mimic a dead oak-leaf.

Niphanda fusca, Brem.—Not common. Two specimens on a hill-top in Leu-kung-tao on 12th July, 1898.

Cupido argiades, Pall.—Common all the warm season. There are apparently three broods, in April, June, and September. The forms *amurensis*, Rühl., and *hellotia*, Mén., occur.

Cupido argus, L.—Common in May and September.

Everes fischeri, Ev.—Leu-kung-tao; common on 3rd May, 1899, in sheltered grassy places.

Cyaniris argiulus, L.—Mainland; two females on 18th June, 1898.

Zizera maha, Koll.—Common in grassy places from May to October. The earlier forms fall under var. *marginata*, Poujade, whilst those found later in the year are referable to var. *opalina*, Pouj.

Chrysophanus phlaeas, L.—Abundant from April to October, being apparently triple-brooded. Vernal specimens are much more typical (*i.e.* the copper-colour is paler) than the generality of Asiatic specimens; those taken in June are small and much suffused with black, whilst those captured in September are large and dark. They are all referable to var. *chineseis*, Feld., and the two later broods fall under var. *eleus*, Fb. I have seen none as black as those I have taken in Japan (summer brood), in which the copper is almost wholly concealed by black scales.

NOTES AND OBSERVATIONS.

THE LEECH COLLECTION OF LEPIDOPTERA.—This exceedingly fine collection has been deposited in the Natural History Museum at South Kensington. We hope to have something further to say touching this matter in our next issue.

NOTE ON A THIRD BROOD OF *SELENIA ILLUNARIA*.—On July 25th last year a typical female specimen of the var. *juliaria* was captured near here, and deposited ova. The larvæ fed up well on plum, and twelve pupated on September 8th and following days. The breeding-cage was kept in a greenhouse, and the weather at the time was not unusually hot; but to my surprise, nine days later four moths had appeared, two of each sex. On comparing the specimens with normal *juliaria*, I was unable to distinguish them. The remaining pupæ, following the ordinary course of things, began to emerge March 16th last, and five imagines have been obtained from them up to the present time. These are all well-marked examples of the large and dark spring form. The imagines of the third brood, which appeared in September, readily paired, and a few ova hatched in about fourteen days. Unfortunately the larvæ fed up very slowly, and did not thrive on the honeysuckle, which was all I had to give them, and only one spun up in a leaf about the beginning of December. This, emerging indoors on March 10th, is a small specimen, not larger than the average *juliaria*, but has the richer coloration which we expect from the winter pupæ of the species. It is sufficient to show that a complete third brood had been interpolated. The occurrence of treble broods of seasonally dimorphous species under conditions approaching those in nature seems of interest, since it may possibly add something to our knowledge of that very interesting subject. The evidence produced above is meagre enough, but so far as it goes shows that *Selenia illunaria* = *juliaria* behaves in a similar way to *Vanessa levana* = *prorsa*, as observed by Weismann in his later experiments (*vide* Ent. xxix. p. 105, *et seq.*). That is to say, the third brood assumes the summer form *juliaria* when it takes the unusual course of developing rapidly the same year. It is also noteworthy that there was no approach to *illunaria* in my specimens, such as might be expected if there were any tendency to alternation of form, apart from the influences of temperature and hybernation.—W. S. GILLES; Bocking, Braintree, April 12th, 1901.

XYLOMIGES CONSPICILLARIS.—In your last issue (*ante*, p. 130), Mr. Doidge mentions breeding this insect from "dug" pupæ. As Barrett, in his 'British Lepidoptera,' says the pupæ are generally found at the roots of trees, it would be interesting to know whether Mr. Doidge obtained his pupæ from such situations, and, still more so, if he could tell us the particular species of tree. As the larvæ feed on bird's-foot trefoil, the base of tree trunks seems an unlikely situation. But I suppose there is no possibility of its being at times a "tree-feeder."—PERCY C. REID; Feering Bury, Kelvedon, April 5th.

VITALITY OF ALPINE RHOPALOCERA.—Mr. Howe's note on the vitality of *H. rupicaprararia* (*ante*, p. 131) is interesting, and it must be taken

for granted that winter flying moths are capable of bearing considerable extremes of cold. In a somewhat similar connection I have more than once come across cases in the Alps of what appears to be remarkable recuperative powers in Rhopalocera. I have rarely crossed a high mountain pass, where the snow lies from year's end to year's end, without coming across various kinds of insects frozen on the surface. I remember some years since traversing the Neiderjoch Pass between Vent and Unser Frau on the way to Meran. A number of Pieridi were scattered upon the ice, and among them a specimen of *Colias phicomone*, a high flying species. The Pieridi seemed to be dead, though I did not pick any of them up; the *Colias*, however, I boxed, and on descending below the snow line on the other side, exposed it to the now powerful rays of the sun, with the result that it recovered some semblance of wing action, and when left was fluttering about in the grass. It must have been frozen hard for some hours, as I was on the snow about six o'clock in the morning. But what attracts non-migratory species to these altitudes I cannot determine; yet it is a common experience to meet such generally lowland species as *Gonepteryx rhamni* and even *Papilio machaon* up to eight thousand feet; and among other butterflies which I have found frostbound is *Melitæa cynthia*, an alpine species certainly, and perhaps for that reason the less likely to be surprised on the glaciers. Running water exercises a great attraction for some Lepidoptera. Perhaps the glare of the snow may also have a fascination for others which inhabit the higher regions of the Alps.—H. ROWLAND-BROWN; Oxhey Grove, Harrow Weald, April 9th, 1901.

APPLICATION FOR BRITISH STRATIOMYIDÆ, &c.—In this magazine for August, 1897, I made a request that I might be assisted in examining freshly caught specimens of Platypezæ. The result was astonishing, as fine series of little-known species were sent me from various sources, and I was consequently enabled to clear up many very complicated cases of synonymy, not only for Britain. but also for Europe. I am now working at a second volume of my 'British Flies,' which would be vol. v. of the 'Scheme.' This volume is entitled 'Stratiomyidæ to Cyrtidæ' in my introductory notice. I want to see British specimens of all species which appeared in italics in my 'List of British Diptera' for these families. I should also like to see any specimens of *Odontomyia* (except *O. ornata*, *O. tigrina*, and *O. viridula*), and any specimens of *Oxycera* (except *O. pulchella* and *O. trilineata*). *Sargus flavipes* is at present a jumble, and I specially want to see the male of a species which occurs in the Forest of Dean. Any Xylophagidæ will be welcome. *Hemato-pota italica* should be looked for in the neighbourhood of Leigh and Southend in Essex. I should be glad to examine any of the uncommon species of *Tabanus*, and I especially want to see good series of any species of *Therevidæ* (except *T. annulata* and *D. anilis*), but they must be in most perfect condition as to their pubescence. In a similar way I want to see series of the "Paniscus" group of the genus *Anthrax*, but the greatest care should be taken that the pubescence is not injured. Specimens of *Scenopinus* are welcome, and I should be glad to receive authentic localities for all species which will be included in the volume.—G. H. VERRALL; Sussex Lodge, Newmarket, April, 1901.

THE LEPIDOPTERA OF LEWIS.—Mr. H. McArthur has started on an entomological expedition to the island of Lewis, where in former years he has obtained some most interesting insects. Collecting in the Orkneys, Shetlands, and the Western Isles of Scotland is not always an unalloyed pleasure. There are difficulties to contend with and discomforts to be borne, which probably few of us feel disposed to encounter. It is therefore largely due to Mr. McArthur, and a few other enthusiastic collectors, professional or amateur, that our cabinets contain specimens from these remote localities. His last journey to Lewis was in 1887, and we believe that little entomological material has been brought from the island since that date.

ERRATUM.—P. 130, last line, for “female” read “male.”

CAPTURES AND FIELD REPORTS.

VANESSIDÆ IN 1900.—With reference to some notes on the genus *Vanessa* that have appeared in your last two or three issues, I thought, perhaps, that a few observations on these insects made in Glamorganshire might prove interesting. *Vanessa urticae* has been somewhat scarce as compared with the three years previous. *V. polychloros* is, as far as my observations go, very scarce in this district: during 1900 I saw but one specimen (September 3rd). *V. (Cynthia) cardui* is during some seasons of frequent occurrence, but during this season I did not see it anywhere in this district, although I saw it several times on the other side of the Channel (Weston-super-mare). It is of *V. io* and *V. atalanta* that I write chiefly, and of these two Vanessids I saw a larger number at one time than has ever before been my lot to witness. During July I saw, in various localities in this neighbourhood, numbers of the larvæ of *V. io*, which led me to expect an abundance of the perfect insect. On July 9th I took ten full-grown larvæ, eight of which pupated on July 11th, the other two on July 12th and 13th; on July 21st they all emerged. On Sept. 3rd I visited “Castell Coch,” near Taff’s Well, about seven miles from Cardiff, and on entering a field that was perfectly blue with *Centaurea cyanus*, I was struck with the number of *V. io* and *V. atalanta*, but this was nothing as compared with what was to come, for on passing out of the field and entering a narrow path, at the bottom of a woody slope, which was thickly clothed on either side with the same pretty blue flower, I was confronted with swarms of these two Vanessids, together with a host of bees and other Hymenoptera and various Diptera. I do not ever remember seeing such a remarkable sight as presented by the two butterflies (of which there must have been several hundreds) as they rested expanded in the hot sunshine, or chased one another from flower to flower, their brilliant colours contrasting with the green and blue of the foliage and flowers, and the more sombre brown of an occasional *Argynnis paphia* or the deep red-brown of *V. c-album*, forming a picture of almost kaleidoscopic beauty. The last-named Vanessid is of pretty general occurrence in Glamorganshire, but never, so far as I have seen, in any numbers. I noticed that the bees were very intolerant of the presence of the butterflies, driving them off the flowers repeatedly, and indeed *io* and *atalanta* seemed to adopt a belligerent attitude towards one another. I hope to visit the same place

again in the autumn of 1901, trusting to see the lineal descendants of my last year's friends. I might mention, *en passant*, that I took a number of *Colias edusa* during September, but did not see *C. hyale* at all. — J. E. CAMPBELL-TAYLOR; Roath Park, Cardiff, April, 1901.

VANESSA POLYCHLOROS.—A fine specimen of the large tortoiseshell, which had evidently hibernated there, was taken in a house at Kingston-on-Thames, in the afternoon of March 31st, and given to me.—H. E. ANNETT; Church Street, Walton-on-Thames.

VANESSA ATALANTA.—A larva of this butterfly, about one and a quarter inch long, was given to me at the beginning of September, 1900. It received no more food, and pupated at the end of the month. From this a very small but perfect imago emerged a few days before Christmas. The pupa had of course been kept indoors. — K. RAINBOW; King's Road, Kingston-on-Thames.

LEUCANEA EXTRANEA AND DASYCAMPA RUBIGINEA AT TORQUAY.—I should be pleased if you would record the following in the pages of the 'Entomologist':—In searching the willow blossom near here, I had the good fortune to capture two specimens of *D. rubiginea*, one of them a splendid specimen; also, later in the evening, I saw a larger moth dart from the blossom and settle on a piece of bramble. This I captured, and found it to be a magnificent example of *Leucanea extranea* (female). As I could hear it very restless in the box I killed it, and, except for a small part of fringe of right upper wing missing (this I knocked off during the few minutes in box), it is in fine condition. I showed it to my friend Mr. Terry, and he, without hesitation, congratulated me.—M. CROCKER; 7, Westbourne Grove, Torquay, April 11th, 1901.

XYLOMIGES CONSPICILLARIS IN SOMERSETSHIRE.—I am glad to be able to confirm the occurrence of *X. conspicillaris* at Taunton, as recorded in the last number of the 'Entomologist' (*ante*, p. 130). On Good Friday, April 5th, a fine specimen of this insect emerged in my breeding-cage, from pupa dug near Taunton early in January last. — ALFRED S. TETLEY; Llwynon, Newtown, North Wales, April 10th, 1901.

LYCENA ARGIOLUS IN LONDON.—At half-past ten o'clock this morning I observed a specimen of *L. argiolus* flying about a chestnut-tree in the garden of Moreton House, which stands at the eastern corner of the Gilston and Brompton Roads, South Kensington. Unless the butterfly had been bred indoors and released on emergence, its appearance at so early a date, considering the cold and backward spring, seems as strange as the locality in which it was observed.—R. S. MITFORD; 35, Redcliffe Square, South Kensington, S.W., April 22nd, 1901.

On April 25th I saw a specimen of *L. argiolus* flying around a lilac bush in Lillie Road, West Kensington.—H. McARTHUR; 35, Averill Street, Fulham Palace Road, W.

EARLY SPRING IN WEST SUSSEX.—For various reasons I was unable to do any field-work before February, when I began pupa-digging. The first emergence was that of *Taniocampa incerta* on Feb. 18th, and on the same date I took a fine dark *Phigalia pedaria*, at light. The first *Hybernia leucophæaria* was taken the following day. On the 25th *Taniocampa pulverulenta* emerged, and I also found two larvæ of *Arctia villica* in their winter quarters while pupa-digging. On the 26th *Taniocampa*

gothica and *T. stabilis* began to emerge, followed on March 2nd by *T. munda*. *Hybernia marginaria* I did not see till March 4th, and on the following day *Eupithecia abbreviata* emerged. On the 11th *H. rupicaprarica* came to light—the only specimen I have seen this year, and *Anisopteryx æscularia* has been conspicuous by its absence. *Panolis piniperda* I took on April 2nd, and on the same day found a cocoon of *Dicranura bicuspis*, empty. *Vanessa io* was seen on April 1st, and *V. urticae* on the 2nd. Two *Xylocampa lithorhiza* were taken on the 4th, and two nice *T. gothica* var. *gothicina*, male and female, at sallow, on the same evening. *Scopelosoma satellitia* at sallow on the 5th, and the last *H. marginaria* the same day. *V. polychloros* was first seen on April 9th, and is now absolutely abundant; I see dozens every day. Their courtship is chiefly performed around the tops of the ash-trees, which are now in full bud. If hybernated specimens are any criterion, this should be a great “*Vanessa year*” in this part of the country at least. *V. urticae*, of course, is everywhere, and *V. io* is commoner than I have seen it for some years. On April 10th *Anticlea badiata* was taken at light, and on the 11th *Gonoptyx rhamni* was seen; this species is also abnormally abundant. On the 14th *Lithosia sororcula* emerged from out of my captures while digging. By the way, I notice this species is almost unanimously given as feeding on the lichens of larch, pine and birch. This cannot be the case here; the insect is fairly common on all the oak-trunks around here, but we have practically neither birch nor pine within six or seven miles. *Pieris rafi* appeared on the 17th, and *Taniocampa miniosa* (two) at sallow on the 18th, while on the same day a fine male *Asphalia ridens* emerged; this from a larva bred last summer. On the 20th *Heliaca tenebrata* emerged from a captured pupa, and on the 21st I saw the first *Pieris napi*.—J. AYLWARD CHURCHILL; Billingshurst, Sussex.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—March 20th, 1901.—Mr. G. H. Verrall, Vice-President, in the chair.—Mr. Willoughby Gardner, F.L.S., Reform Club, Liverpool; Mr. F. Hopson, 16, Rosslyn Hill, N.W.; Dr. C. A. Ledoux, Grahamstown, South Africa; Mr. C. P. Pickett, Leyton, Essex; Mr. W. G. Smith, 164, Wells Road, Knowle, Bristol; Mr. G. A. Waterhouse, B.Sc., Sydney, New South Wales; Mr. H. H. Whyman, M.A., Montreal, Canada; and Mr. F. C. Woodforde, Market Drayton, were elected Fellows of the Society.—Mr. C. J. Watkins sent for exhibition a series of larch twigs, illustrating the winter condition of *Coleophora laricella*, the special feature being the manner in which the cases of the larvæ assimilated in colour with the bark of the larch.—Mr. G. B. Routledge exhibited a specimen of *Hydrilla palustris*, taken on the wing by Mr. J. E. Thwaytes when sugaring near Carlisle on June 10th, 1899. He said it was the first male taken in that district, and Mr. C. G. Barrett remarked that it was the most definitely marked specimen of any known, and that in the northern locality the lines on the wings seemed to be brought out with greater distinction than in the fen country and elsewhere. He also exhibited specimens of *Bembidium schuppeli*, a rare beetle captured on the banks of the river Irthing.—

Mr. R. McLachlan exhibited Trichopterous larva-cases of the form known as "*Helicopsyche*," from the Prony River, New Caledonia, sent to him by Mr. J. J. Walker, R.N. They were large, and remarkable for the size of the individual sand-grains of which they were built up. These sand-grains, Mr. Walker informs him, were water-worn particles of the heavier minerals of the river-bed, such as chrome, nickel, and iron ores. It is possible that similar cases were alluded to by Hagen in the Stett. Entom. Zeitung, 1864, p. 129, from the Munich Museum.—Mr. G. T. Porritt exhibited specimens of an almost black form of *Acronycta menyanthidis* from Skipwith Common, near Selby, and stated that the same form was also common on Strensall Common, near York. For comparison he also showed specimens from the moors near Huddersfield. The chief interest in the exhibit consisted in the fact that in both the districts where the melanic *menyanthidis* occurred, melanism was not a common feature; whereas in the Huddersfield district, where only the pale form of *menyanthidis* was taken, melanism was a conspicuous feature in many species, even in and close to the grounds where only pale *menyanthidis* could be found.—Mr. H. W. Andrews exhibited a female specimen of *Amphidasys betularia*, with hind wings aborted and scarcely developed, taken at Paul's Cray, Kent, in May, 1896.—Mr. H. Rowland-Brown stated that he had seen an announcement that the County Council had under consideration the feasibility of stocking the London parks with Butterflies, and encouraging those which already existed there. He said that, according to the latest observations, thirty-nine species of Rhopalocera were recorded within, roughly speaking, a ten-mile metropolitan limit, but that of these he only knew of *Pieris rapæ*, *P. napi*, *Vanessa atalanta*, *V. urtica*, and perhaps one or two others which could, strictly speaking, be said to inhabit the Metropolis itself. A discussion followed on the subject, in which Mr. A. J. Chitty said that *Pieris brassicæ* had occurred in the garden of his London house, and that he thought *Vanessa polychloros* might be added to the list of those open to experiment, though Mr. R. MacLachlan thought that it had ceased to be a London insect. Mr. G. H. Verrall also advocated the introduction of tropical and other foreign species in the great conservatories of Kew, where, without danger to the plants, they would be objects of great beauty and attractiveness. He considered the experiment, at any rate, worth the trial. Mr. H. Goss continued the discussion, and Mr. F. Merrifield, while recognising the difficulties arising from soil, climate, and surroundings, expressed his belief that certain hardy species would be more than a match for their bird enemies.—H. ROWLAND-BROWN and H. GOSS, *Hon. Secretaries*.

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.—March 11th, 1901.—Mr. F. R. Dixon-Nuttall opened the meeting by giving the Society a most cordial welcome to St. Helen's. The Vice-President, Mr. R. Wilding, occupied the chair. Mr. Wilding, in his opening address, said that he thought that the new departure of holding occasional meetings in other towns than Liverpool would be conducive to the life and well-being of the Society. The Rev. R. Freeman began his paper by exhibiting and explaining a coloured map, drawn by himself, showing the district which the St. Helen's naturalists are

working—a district of five miles radius around the town, which comprises woodlands, hills, mosses, marshes, and pastures. From his own particular section of Simonswood, he recorded one hundred and eighty species of Macro-Lepidoptera. The most interesting of these are *Cænonympha davus*, *Notodonta dictæoides*, *Acronycta leporina*, *A. menyanthidis*, *A. alni*, *Mamestra anceps*, *Hadena glauca*, *Heliodes arbuti*, and *Carsia imbutata*. The most abundant species is *Cymatophora duplaris*, whose larvæ occur in thousands on the birch trees. Mr. F. C. Thompson gave his experience of the Knowsley district, which is rich in old woods, mosses, lakes, and pond-holes. On the whole, the species are the same as at Simonswood, with the addition of *Agrotis puta*, *Noctua triangulum*, *Dianthæcia capsicola*, *Epione apiciaria*, and *Ennomos erosaria*. Mr. Alfred Jackson read an interesting account of his doings in the Bold district. He stated that he had taken the eggs, larvæ, pupæ, and imagines of *Odonestis potatoria* in a single hour. He also described with what delight he had captured his first specimens of *Colias edusa*, an insect he had thought would never have visited this district of smoke. He told an amusing story of a policeman who, attracted by his lantern, became infected with the entomological fever, and chased *O. sambucata* with his helmet, thereafter becoming a zealous collector. Dr. J. Cotton read notes on the Eccleston district, and described the sight which may be seen on a favourable August night at Eccleston Mere of thousands of *Xanthias* (*X. cerago*, *silago*, and *ferruginea*) sitting on the leaves of the willows which grow there. To the lists of his colleagues Dr. Cotton added *Thyatira batis*, *Plusia festuæ*, and *Melanippe tristata*. The Chairman proposed a hearty vote of thanks to the St. Helen's naturalists for a most enjoyable and profitable evening, which was seconded by Mr. F. Birch, and carried unanimously. Mr. F. R. Dixon-Nuttall, in his reply, described the St. Helen's parks, and assured the members that the smoke of the factories had much diminished of late years. Mr. Wilding exhibited a case of specimens of *Deilephila galii* reared in 1887. Mr. Pierce, a unique collection of *Vanessa antiopa* showing all the variations from the type to the most extreme dark forms. Mr. J. Collins, of Warrington, exhibited the pupæ of *Acronycta leporina* spun up in dead sticks, as found by him on the mosses.—FREDERICK BIRCH, *Joint Hon. Sec.*

RECENT LITERATURE.

Third Annual Report of the Kendal Entomological Society. Session 1900.
Pp. 31. Kendal: 1901

Contents:—Rules of the Society. List of Members (thirty-three, of whom six are honorary). President's Address (5 pp.). "Notes on *Colias edusa* and *Acherontia atropos*," by Rev. A. M. Moss (7 pp.). "Rearing of Lepidoptera," by Mr. Frank Littlewood (10 pp.). "List of the Macro-Lepidoptera of the Kendal District" (5 pp.). Balance-sheet.

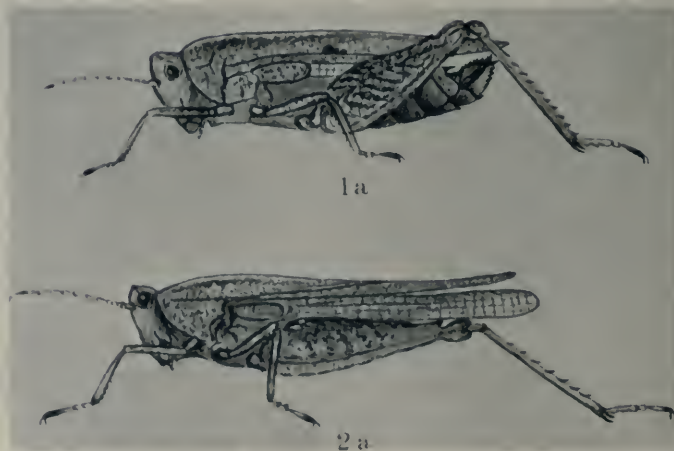
In his interesting remarks on the occurrence of *C. edusa* and *A. atropos* in 1900, Mr. Moss briefly reviews the records concerning the first-named species since 1877. The paper on rearing Lepidoptera is a most useful contribution and worthy of careful perusal. Three

hundred and seventy-four species are enumerated in the local list of Lepidoptera, which is admitted to be incomplete, and it is proposed to publish supplementary lists in each succeeding year. In his address, the president (Rev. A. M. Moss) deals chiefly with the work of the Society, but in his opening remarks he refers to the progress of entomology during the latter years of the nineteenth century. We are pleased to find that the finances are in a flourishing condition, the cash balance at the close of the past year being almost twice as large as that brought forward from the previous year. So far, not much beyond field-work and matters directly connected therewith have been attempted, but these have been well done.

Transactions of the City of London Entomological and Natural History Society for the year 1900. Pp. 74. London Institution, E.C. 1901.

The entomological papers are:—"Secondary sexual characters in British Coleoptera," by Mr. H. Heasler"; "Re-classification of the Lepidoptera," by Mr. W. J. Kaye; "A few Days at Fusio," by Dr. T. A. Chapman (with notes on the Geometrids by Mr. L. B. Prout). A further instalment of the lepidopterous "Fauna of the London District," bringing the subject up to the end of Geometridæ, is also given. The President's address, it must be added, is exceedingly interesting reading, and we heartily commend it to the notice of those who are not, as yet, students in the advanced school of entomology. The various matters referred to in the "Reports of Meetings" are of the usual instructive character.

LEPIDOPTERA.—A. G. MAYER carried 449 cocoons of *Callosamia promethea* from Massachusetts to Loggerhead Key (off the Florida coast, many hundred miles south of the southernmost range of the species), and experimented on the way in which the emerged females attract the males. Males do not come to females in hermetically sealed glass boxes, though they congregate about boxes which do not admit of a sight of the female, but which allow odours from the female to escape to the outer air. They will seek out such boxes even when the vapour of carbon bisulphide is escaping from the box, together with such odorous material as the female may produce. Females thirty to sixty hours old are much more attractive to males than young females five to ten hours old. Virgins are somewhat more attractive than fertilized females of the same age. The sense-organs thus stimulated are the antennæ, for when these are covered with impervious materials, the males no longer seek the females. If the eyes of a male are covered over with Brunswick black to prevent sight, he will still mate normally if placed near a female. The wings of the females are reddish blue, those of the males darker; yet, if these be interchanged (by means of glue), no apparent disadvantage in mating is suffered by either. These and other similar observations lead the author to conclude that the sexes pay no attention to the appearance of their partners, and that the dark colouration of the male has not been brought about through sexual selection on the part of the female.—"On the Mating Instinct in Moths," 'American Naturalist,' 1900, pp. 674-5, ex 'Psyche,' ix. (1900), pp. 15-20.



W. J. Lucas del.

West, Newman photo.

Tettix bipunctatus.—1. Dorsal view. 1a. Lateral view. $\times 4\frac{1}{2}$.
Tettix subulatus.—2. Dorsal view. 2a. Lateral view. $\times 4\frac{1}{2}$.

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ORTHOPTERA IN 1900.

BY W. J. LUCAS, B.A., F.E.S.

(PLATE III.)

DURING 1900 little of importance seems to have been done or observed in connection with the British representatives of the Orthoptera, and were it not that records in connection with this order are few, it would be out of place to publish the following brief notes of my own, especially as my work in the order during the year was very spasmodic. In all, or nearly all, the other orders new species have been added to the British list, but the total of the Orthoptera remains unchanged; perhaps no more are left to be discovered.

Among the **Earwigs**, Mr. Ashdown again found *Forficula lesnei* common in the old locality in the neighbourhood of Rammore, in Surrey. There was, of course, no dearth of *F. auricularia*. On Sept. 16th, one beaten from a tree on Esher Common, about 10.30 a.m., had apparently just cast its last skin, and was of a uniform pale creamy-white tint, except the eyes, which were black, and a little dark cloudiness in one part of the abdomen, due apparently to the contents. The insect, which was a male, had practically assumed its correct colouring by the evening.

As regards the **Cockroaches**, females of *Ectobia lapponica* were taken at sugar on Aug. 7th and Aug. 11th at Ramnor, in the New Forest; the little *E. panzeri* was found, and seemed to be common, at the sandhills near Studland in Dorset; and on Sept. 26th a specimen of *Rhyparobia maderæ* was received alive and in good condition from Mr. South, who received it on the night of Sept. 25th from Mr. H. O. Dixon, the latter stating that he found it "in his desk at Covent Garden the previous evening." The insect is now in my possession.

Turning to the grasshoppers with short antennæ (*Acridiodea*), *Mecostethus grossus* was again found in the New Forest, and at Denny Bog on Aug. 7th one or two females were very large. *Stenobothrus lineatus* was taken on Aug. 8th near Studland, in Dorset, and on Aug. 18th between Lulworth and Weymouth. *S. viridulus* was secured in the New Forest on Aug. 1st and 13th. The very common and variable species, *S. bicolor*, was noted in the New Forest, and by the coast near Milton, in Hampshire; near Studland and Portland, in Dorset; at Chilswell Hill, in Berks; at Esher Common and near Oxshott and Claygate, in Surrey. On Esher Common a large female was taken as late as Nov. 4th. The almost equally common *S. parallelus* was noted in the New Forest and near Oxshott. The better species, *S. rufipes* and *S. elegans*, I did not meet with. *Gomphocerus maculatus* was taken in several places, but *G. rufus* was not found. The little *Tettix bipunctatus*, which hibernates in the perfect form, was met with on May 19th at Oxshott, early in June in the New Forest, and on August 11th on the coast near Milford, in Hampshire. With the last amongst the fallen cliffs I also took its less common congener, *T. subulatus*, which I had not previously captured. As these two grasshoppers are by description somewhat alike, and, owing to their very diminutive size, no doubt often overlooked, figures of their dorsal and lateral aspect are given on Plate III. for comparison. Both are unique amongst British grasshoppers in having the pronotum produced posteriorly so as to cover the dorsal surface. With regard to *T. bipunctatus* should be noticed its stouter build; the two black spots on the pronotum, which, however, may be indistinct or absent; the diminutive wings, and the backward prolongation of the pronotum extending not quite to the knees. *T. subulatus* is more slender, does not possess the black spots, has better developed wings, and has the prolongation of the pronotum produced considerably beyond the knees.

Of the division of the grasshoppers with long antennæ (*Locustodea*), *Leptophyes punctatissima* was met with on several occasions in the New Forest, and was there perhaps more common than usual last season. Being wingless, it must either be picked off the herbage, if its colour will allow it to be discovered, or else taken with the sweeping net. To preserve the beautiful green colouring the abdomen must be emptied, and its contents replaced by a tiny roll of cotton-wool. In fact, the same must be done with all the Locustodea and the larger Acridiodea. *Meconema varium* was taken on Oct. 7th from a fence in Kingston-on-Thames. *Xiphidium dorsale* was again taken at Hengistbury Head, in Hampshire. On Aug. 8th, at the sandhills near Studland, in Dorset, an immature specimen was observed to be extremely well protected on a blade of grass, where it rested with its legs stretched out in a line with its body

in some such manner as many of the long-legged spiders do; such a position it took up very readily. This grasshopper seems always to affect the same kind of grass—a soft pale green species that grows in great tufts. On the evening of Aug. 7th, in one of the rides at Ramnor in the New Forest, I found some numbers of the singular wingless grasshopper, *Thamnotrizon cinereus*, one or two taken being still immature. After being killed (as was supposed), eviscerated, and set, two were found after several hours to be alive as regards the fore part of the body—a striking instance of vital tenacity. On Aug. 13th, near Rhinefields, a very large female of the same species was captured. On a broken piece of cliff-side between Lulworth and Weymouth, I took, on Aug. 18th, two females of *Platycleis grisea*, this being my first capture of the species, which is not, I believe, a specially scarce one, and is certainly conspicuous. *P. brachyptera* was, as usual, plentiful at the end of the summer on Esher and Oxshott Commons.

Of the *Grillodea* (Crickets), the only species that I met with was *Nemobius sylvestris*, which was found in several distinct districts in the New Forest, its only British home. No doubt it is well distributed there, its favourite haunts appearing to be amongst dead leaves on the banks of streams, but well up above the water.

Kingston-on-Thames: May, 1901.

LIFE-HISTORY OF COLIAS HYALE.

By F. W. FROHAWK, M.B.O.U., F.E.S.

(Continued from 'Entomologist,' vol. xxv. p. 274, 1892.)

FROM the observations I carried out respecting the earlier stages of *Colias hyale* in 1892 and 1893, I then felt convinced that this species hybernated in the larval condition, as stated in the 'Entomologist,' 1893, vol. xxvi. p. 146. I am now able to verify this to be the case from observations made during the past eight months upon a very large number of *C. hyale* larvæ possessed by friends and myself, and by their assistance I have been able to complete the life-history of this most interesting species.

The large number of larvæ I had last autumn, which hatched from the ova at the end of August, were all subjected to a high temperature with much sunshine during September; but, notwithstanding, they grew very slowly, and towards the end of the month they ceased feeding and entered into hybernation, being then quite small, the majority measuring about $\frac{1}{4}$ in. long. On December 21st I placed many of them in the sun,

it being a bright warm day with a sun temperature of 73° , but they all remained motionless. On the 3rd of January, with a shade temperature of 48° , I observed one larva feeding slowly; from that date others occasionally fed. On January 17th those from ova deposited on September 12th began crawling about in search of fresh food. The plants having only a few living leaves, I removed forty of the larvæ on to a fresh plant with a good supply of young leaves; they all crawled up the stems and rested on the petals, mostly on the under side, but they did not commence feeding until the 20th, when I noticed several feeding, and again on the following day, when it turned warmer, the outdoor shade temperature at 11 a.m. being 52° , and indoors 60° , where the larvæ were kept. It apparently is the usual habit of the larvæ of *hyale* to leave their hybernaculum about the middle of January in their more southern home, as those I had in 1892 did the same. February 12th was a cold, almost cloudless day after a very cold early morning of 22° , but a slight haze prevented much warmth from the sun, as the temperature in the sun did not rise above 54° where the larvæ were, but for the want of more heat they remained nearly motionless all day.

In the continuous dull weather during February and March the larvæ were kept near a fire during the daytime, but from the dullness of the weather they showed little signs of activity, and fed but slightly; but from 5 to 11 p.m. nightly they were placed on a chimney-piece over a fire and directly under a gaslight, which appeared to suit them admirably, as they became active and fed on and off all the time, yet they made but slow progress, although a few moulted for the third time, and they all gradually died, the last one dying on March 16th, having lived for about two hundred days. I was so far enabled to figure and describe the larva after the third moult—description presently.

I will now allude to another brood of *hyale* larvæ, which Messrs. Cope and Hawkins had under observation, from ova obtained the middle of August last. They all commenced hybernating during September, and at the end of that month the plants containing the larvæ were placed in a greenhouse, which was kept at a moderately warm temperature throughout the winter, the night temperature not going down below 44° . These were left untouched until the third week of February, when my friends found forty still living, the majority of them having moulted the third time. They made satisfactory progress until many had reached their last stage, when they gradually died off, and only one succeeded in pupating on March 6th, which, however, was slightly malformed, and produced a crippled yellow female on April 4th.

On March 18th Mr. W. A. Cope kindly gave me, for the purpose of figuring, the last remaining larva, almost full grown, which I figured the following day, when it measured just an inch in

length. It finally became fully grown on April 6th, and measured one and one-sixth inch long, but died the following day.

To Mr. J. H. Carpenter my especial thanks are due, as with his assistance I have been able to complete the life-history of this species. He obtained a large number of ova from a female captured at Sheerness on August 18th last. The larvæ started hybernation at the same time as those of all the others we had under observation, when fortunately he placed them all (between two hundred and three hundred) in a store room which, from its situation, remained at a fairly uniform temperature throughout the winter; during the coldest nights it did not go below about 42°. The plants on which the larvæ were confined were kept near a window, and were unattended to all through the winter, consequently the plants dried up, which evidently is the cause of the success he has attained with them, which he says is due more to accident than otherwise, as he had but slight hopes of pulling them through, so left them unattended. From the result of our observations, it appears that it has been the moisture from the mould in the pots containing the living plants, which were kept watered through the winter, that caused so much fatality with Messrs. Cope's, Hawkins's, and my own larvæ. As the temperatures mine were subjected to until the end of January were almost similar to those in Mr. Carpenter's possession, it therefore seems evident that it is during hybernation that they require dryness, and to be kept from frost. After hybernation my friend had about two hundred larvæ living; but many of them died subsequently, no doubt from being exposed to a few (two or three) degrees of frost, coupled with the dampness then arising from the freshly potted plants. He has, however, met with so much success that, at the time of writing, he now has over one hundred pupæ. When I examined his larvæ on March 9th, I found they were in the same stages as those I had. On April 24th I again visited him, and found he had about one hundred and twenty larvæ, many about full grown, and a couple of pupæ; the first one pupated on April 20th. This and some larvæ he very kindly gave me (from this pupa a male emerged on May 7th). With this aid I have completed figuring and describing the final stages of this butterfly.

As all the earliest stages from the deposition of the egg to second moult inclusive, I published in the 'Entomologist,' 1892, vol. xxv. pp. 271-274, I will now continue with the various remaining stages—from larvæ which hatched on August 29th, 1900, from ova deposited August 19th. The hybernation stages are after the second and third moults.

After the third moult when hybernating and one hundred and eight days old, it measures $\frac{6}{19}$ in. long; colour uniformly green, the spiracular line whitish green, dilated and divided into four lobes of unequal sizes; on the second one, which is the largest, is placed

the large conspicuous shining black spiracle ; on the adjoining posterior lobe is a primrose-yellow oblique blotch ; each segment is transversely and deeply wrinkled, the centre one so much so that it gives each segment a double appearance. The entire surface is densely sprinkled with black shining warts of various sizes, some extremely minute, each one emitting a black shining bristle ; these are straight on the dorsal surface, and rather curved on the lateral region, all being directed in various positions. The head, legs, and claspers are similar to the body, all being covered with bristles, and of a green colour. The body is also extremely finely granulated with the minutest black specks, principally on the dorsal area ; these, together with the black bristles, give the larva a dark green colour and a rough appearance. From this stage the large black spiracles become less conspicuous.

After hybernation and after third moult—over one hundred and sixty days old—it measures $\frac{1}{2}$ in. long ; the whole colouring clearer and lighter than during hybernation ; the head ochreous-olive, and the spiracular line pale lemon-yellow.

About a week after the fourth moult—two hundred and twenty days old—it measures $\frac{3}{4}$ in. long ; the general colouring and form almost exactly similar to the previous stage, excepting the spiracular line is rather whiter, and in some specimens the yellow markings on the line are faintly shown ; the spiracles in most cases are less black, having whitish centres, and the head is generally ochreous tinged with green, but some have almost clear green heads.

After fifth and last moult—fully grown—it measures $1\frac{1}{4}$ in. long ; is almost cylindrical but slightly largest at the third segment, and tapering at the anal segments. The ground colour is a clear light green, but has a darkish velvety appearance, due to the entire surface being densely sprinkled with black warts, each emitting a moderately long bristle, which are black all over the dorsal surface, and white on the ventral surface ; each wart is encircled with whitish green, and the intervening spaces have excessively minute black granulations ; the spiracular line is tricoloured, having a white upper border running the whole length, the anterior half on each segment is a beautiful rich lemon-yellow reaching just beyond the spiracle, then deepening into orange-vermilion, which fades into orange posteriorly ; the spiracle is white, very finely outlined with black. The head, claspers, and legs are green, and covered with bristles similar to the body.

There is considerable variation in the colouring of the spiracular line ; in some specimens the orange-vermilion is replaced by deep gamboge-yellow, and a remarkable variation occurs in some specimens by having a conspicuous black spot immediately below the spiracular line, precisely similar to *edusa* ; in some

these spots occur from the third to the eleventh segments inclusive; in others it is only on a few of the segments, while others have no trace whatever of them; but usually, when they do occur, they are not so large as in *edusa*. The similarity between the larva of the two species is remarkable, and the only differences which I can detect are as follows:—In *hyale* the black spots below the line are usually less in size, also in number, or altogether absent; the red of the spiracular line extends further, and that the bristles are somewhat darker and longer than those of *edusa*.

The pupa: the length varies from $\frac{13}{16}$ to $\frac{7}{8}$ in., and $\frac{1}{4}$ in. in greatest diameter; the head terminates in a short straight beak, the thorax is humped dorsally, the abdomen rounded and tapering to the anal point; wings ample, rounded and swollen in the middle, reaching the division between the fifth and sixth abdominal segments, base of wings angular; dorsal half of head dark green, ventral half light green, the two shades being divided by a light greenish yellow stripe, which extends along the inner submargin of the wing and spiracular line, enclosing the inconspicuous whitish spiracles. The whole of the dorsal surface varies from pale green to light greenish yellow, in some specimens it is decidedly yellow; there is a medio-dorsal longitudinal line rather darker than the ground colour. The wings are of a duller and darker green, as are the legs and antennæ. The ventral surface of the abdomen is of the same yellow-green as the dorsal surface. The inner margin of the wing is dusky green, which borders on the submarginal yellow line. A subspiracular series of three minute black dots on the abdomen, and below these a lateral dark purplish brown band composed of four oblong markings, one on each segment from the wings downwards, the last being very pale and small. On the wing a sub-hind-marginal series of six black dots, each situated between the nervures and a central black discal dot. It is suspended by a belt of silk round the middle, and the attachment of the anal hooks to a silken pad spun upon the stem of the plant.

The resemblance between the pupa of *hyale* and *edusa* is almost identical, the only differences which appear to be constant are that the head beak of *hyale* is straight, which in *edusa* is slightly upturned, and the apex of the wing in the latter does not reach so far down the abdomen as in *hyale*.

The first specimen, a male, emerged on May 7th, 1901.

Croydon: May 11th, 1901.

ON LABELLING INSECTS.

By E. BRUNETTI.

THERE is a great lack of uniformity in labelling insects, owing to which it is often impossible to distinguish the name of the locality from that of the collector; and with reference to the date of capture, it is impossible to discover what is meant (when the day of capture happens to be less than the 13th) on account of some collectors placing the day of the month first, and others the month.

For instance, a specimen taken on May 10th, 1901, would by some be labelled 10.5.1901, and by others (chiefly amongst Americans) 5.10.1901. On passing from one collection to another, the recipient would be undecided as to whether the figures referred to May 10th or October 5th.

Again, now that exchange abroad is much more common than formerly, it is insufficient to give simply the village or wood in which the insect is taken.

The province or county should also be given, in full if possible, unless the name of the country be also added, when both the latter may be abbreviated; as, for example, "Bradford, Yorks., Eng.," or "Shovel Mount, Burnet Co., Tex."

It must be remembered that there are counties of Middlesex, Surrey, and Cornwall in Jamaica; that there are similar instances everywhere, and hosts of towns with well-known English names in the United States, in Canada, and other colonies; so that specimens so ambiguously labelled as "London," "Victoria," &c., might give rise to much confusion in general collections.

I have the honour, therefore, to propose the following system of labelling all insects:—

1st.—The exact locality to be given in full, invariably including county (or province) also, such as "Bognor, Sussex." "Admont, Styria." "Palm Beach, Florida."; or, if the county's name be abbreviated, the country also to be added, as "Bradford, Yorks., Eng."

2nd.—The date to be invariably given in the following order: day, month, year; and, to further avoid misunderstanding, the month to be given in roman numerals; thus, May 10th, 1901, should read 10.v.1901.

3rd.—The collector's name (if added) to be always placed sideways to the rest of the inscription, and the ticket to be attached to the insect, so that it may be read from the right hand side of the specimen. Examples:—

BRUNETTI	<i>New Forest,</i>
	<i>Hants, Eng.</i>
	16. vi. 1901

CROSBY	<i>Lake Keuka,</i>
	<i>New York.</i>
	14. viii. 1901

The scientific value of collections thus uniformly labelled would, I think, be increased, and reference, at least, much facilitated.

11, Mostyn Road, Brixton Road, London.

A PRELIMINARY LIST OF THE LEPIDOPTERA OF WEI-HAI-WEI.

By THOMAS BAINBRIGGE FLETCHER, R.N., F.E.S.

(Continued from p. 156.)

Fam. PIERIDÆ.

Sub-Fam. PIERINÆ.

Pieris rapæ, L.—Common all the summer near cultivated ground round the villages. They seem mostly referable to var. *orientalis*, Oberth.; the females as a rule have the basal black markings much developed (var. *crucivora*). I noticed that on wet days they often settle on willow-leaves, evidently selecting these because they are of a light tint, and match the under surface better than would most other leaves.

Pieris canidia, Sparrm.—Common in May.

Pontia daplidice, L.—Common all the summer; there seem to be two emergences, one in May and the other in August, but the species is to be found all through the warm season. It has a decided preference for a sandy beach overgrown with a small *Convolvulus*.

Sub-Fam. CALLIDRYINÆ.

Eurymus (Colias) hyale, auct. (= *kirbii*, Lewis).—Common in April and May, and again from September until the cold weather sets in. A white form of the female is fairly common. These Wei-hai-wei specimens agree best with var. *elwesii*, Butl., of the form (? sub-species) *poliographus*, Mots.

Terias anemone, Feld., var. *mariesii*, Butl.—One specimen; Leu-kung-tao, 4th September, 1898.

Fam. EQUITIDÆ.

Sub-Fam. EQUITINÆ.

Jasoniades (Papilio) xuthus, L.—I only met with this species on one occasion, on 28th August, 1898, when it was common in Leu-kung-tao along the hills. This would be the second brood. In Japan, I have taken the first brood (var. *xuthulus*) at Nagasaki in April, but have not seen it at Wei-hai-wei.

Achirus (Papilio) machaon, L.—Fairly common, especially round hill-tops at an elevation of from five hundred to a thousand feet. There are two emergences, the first appearing at the beginning of May, the second about the middle of August. The spring brood is typical *machaon*, the æstival is decidedly var. *asiatica*, Mén.; it is, however, of normal size, and does not approach the large form *hippocrates*, Feld.

Papilio sp.—There is a third Equitid to be found at Wei-hai-wei, but I cannot vouch for the species. One day in July, 1898, I saw a large black *Papilio* flapping about around the top of Centurion Hill, but failed to secure it.

Fam. HESPERIIDÆ.

Sub-Fam. HESPERIINÆ.

Hesperia (Syrichthus) maculatus, Brem.—Fairly common at the end of April and beginning of May.

Hesperia (Syrichthus) sinicus, Butl.—Two specimens; Leu-kung-tao, 23rd July, 1898.

Thanaos (Nisoniades) montanus, Brem.—Common on the mainland amongst oak-bushes on 25th April, 1899, but very local. Pryer states that the larva feeds on oak, and this is probably correct, as I have always found this species associated with oak, both at Wei-hai-wei and Nagasaki.

Sub-Fam. PAMPHILINÆ.

Pamphila guttata, Brem.—Common in July and August, and stragglers remain on the wing until October.

Pamphila sinensis.—One female taken in July, 1898, by Mr. Ph. de la Garde. It is much larger than the average.

HETEROCERA.

Fam. ZYGÆNIDÆ.

Northia trista, Brem.—Seems fairly common on the hills of the mainland, 20th May and 13th June, 1899. The flight is rather weak and "booming."

Syntomis phegea, L., var. *nigricornis*.—Common in June; abundant in 1898, not so common in 1899. There is a good deal of variation in the size of the white spots, especially on the hind wings. The form found here is much smaller than the European type, and constantly differs in wanting the characteristic white tips to the antennæ. Sir George Hampson (Cat. Lep. Phal. B.M., vol. i. p. 110) calls this an aberration, but here it is rather a true variety replacing the type. The larva is common in May, and is to be found on low plants and under stones.

Fam. LIPARIDÆ.

Caviria sericea, Moore.—Common at the end of June. The larva feeds on willow in May.

Euproctis varians, Walk. (= *pusilla*, Moore).—One specimen, bred 2nd July, 1899, from a larva found in Leu-kung-tao on 10th June. The larva recalls that of *S. phegea*, and is found in the same sort of locality. The cocoon is flimsy, and interwoven with larval hairs.

Porthetria dispar, L.—Abundant. The larvæ, which appear to be polyphagous, are to be seen in thousands during May, and are full-fed about the beginning of June. The moth appears in July.

Fam. PSYCHIDÆ.

Metisa aurea, Butl.—One male, bred 7th July, 1899, from a larva found on willow on the mainland on 20th June. There are four males in the National Collection, including the type; two of these are from Yokohama, and two from Pryer's collection, Japan.

(To be continued.)

THE LEECH COLLECTION PRESENTED TO THE NATION.

THE National Collection of Lepidoptera located in the Natural History Museum at South Kensington has recently been greatly enriched by the addition thereto of the almost unique collection of Butterflies from Europe, and Central and Eastern Asia, together with the collection of European Moths, formed by the late John Henry Leech, Esq., of Hurdcott House, Salisbury (see Biographical Notice, *ante*, p. 33).

Arrangements had been made during Mr. Leech's lifetime under which the Museum became possessed of his Eastern Asian Moths, and now the same public institution has acquired the still more important accessions adverted to, through the munificence of his mother, Mrs. Leech, of Kensington Palace Gardens. No more fitting memorial of the eminent entomologist, whose early removal we greatly deplore, could have been devised than that the collection which had afforded him so much pleasure in amassing, and which furnished him with considerable valuable material for faunistic and descriptive work, should find a permanent home in the Museum of his own country. It would have been most regrettable if this magnificent collection had been broken up, and its component parts distributed over the face of the globe—a fate it would probably have met with except for the kind interest in the matter shown by Mrs. Leech, who, it may be added, had at all times encouraged her son in his entomological studies. We have, therefore, very great pleasure in tendering our most sincere thanks to the generous donor for her valuable gift to the nation, and in doing this we can but feel assured that we are giving expression to the feeling of all British entomologists.

We understand that the Museum authorities will publish a Catalogue of the Butterfly collection, so that it is perhaps only necessary to mention here that of Rhopalocera there are rather more than eighteen thousand specimens, representing some eleven hundred species, among which are over four hundred male and female types of species described by Mr. Leech. This collection of Palaearctic butterflies is very rich in Chinese and Japanese species, and in local forms and aberrations of European species. The European Heterocera number about twenty-three thousand specimens, including some fine aberrations and extensive series of the variable species. The collection of Eastern Asian Moths, from which the Museum had already made a selection, comprised nearly three thousand species, of which about eight hundred were made known to science by Mr. Leech.

ON THE NOMENCLATURE OF THE GENERA OF THE RHYNCHOTA, HETEROPTERA AND AUCHENORRHYNCHOUS HOMOPTERA.

By G. W. KIRKALDY, F.E.S.

(Continued from vol. xxxiii. p. 265.)

1827. CURTIS, Brit. Ent. [Feb. 1st] 154. (a) *Dictyonota* t. *eryngii*, nec Latr.¹

1828-30. HEINECKEN, Zool. Journ. v. 35-40. (a) *Cerascopus*² t. *marginatus*.³

1829. LATREILLE in Cuv. Règne An. (Masson's), iii. 27 et seqq. (β) *Dinidor*, *Heteroscelis*, *Cicadella*; ⁴ *Ciccus*; *Bocyidium*; *Tragopa*. (δ) *Gonocerus*, *Syromastes*, *Anisoscelis*, *Nematopus*, *Leptocoris* (1825), *Celidia*, 1821; *Eulopa*, 1814; FALLEN, Hem. Svec. 1-186. (a) *Sciocoris* t. *umbrinus*.⁵ (β) *Bryocoris*; SCHILLING, Beitr. Ent. Schles. i. 34-93. (a) *Platynotus*⁶ t. *apterus*. (β) *Rhopalus*,⁷ *Platygaster*; ⁸ *Ophthalmicus*,⁹ *Heterogaster*; STEPHENS, Nomencl. Brit. Ins. 64-8. (δ) *Ploa*, 1818 [*Kleidocerys*, *Plinthisus*, *Hylophila*, *Orthonotus*, *Pæcilosoma*, *Azinecera*¹⁰].

1830. GERMAR, Thon's Ent. Arch. ii. 1-8, 45-57. (β) *Amphiscepa*; CURTIS, Brit. Ent. [Feb. 1st] 297. (a) *Chorosoma* t. *arundinis*; ¹¹ KLUG, Symb. Phys. (a) *Blissus* t. *hirtulus*; *Pachynomus* t. *picipes*; *Amphibolus* t. *venator*. (β) *Oncocephalus*, *Opsicætus*,¹² *Eumerus*; ¹³ GUERIN, Duperrey's Voy. Coquille, Zool. ii. pt. 2, 165-93. (a) *Scutiphora* t. *picta*; ¹⁴ *Agapophytia* t. *bipunctata*; *Leptoglossus* t. *dilatocollis*; *Ugyops* t. *percheroni*. (β) *Platycoris*, *Megymenum*, *Aphæna*; [*Eurybrachys*, nec descr.].

1830 (?). *HERRICH-SCHAFFER, Panz. Faun. Germ. Fortz. 135. (a) *Cryptostemma* t. *alienum*.

1831. SERVILLE, Ann. Sci. Nat. xxiii. 213-22. (β) *Peirates*; J. E. GRAY, Miscell. 34. (a) *Ptilocerus*¹⁵ t. *fuscus* [HAIN, Wanz. Ins. i. 1-36 [Feb.]] (β) *Cerbus*, *Oriterus*, *Lopus*, *Largus*, *Dicranomerus*, *Phylus*, *Polymerus*, *Apiomerus*, *Loricerus*, *Arilus*, *Cimbus*, *Aptus*.]¹⁶

1832. *SAY, Het. Hem. Indiana, p. 8. (a) *Ascera*¹⁷ t. *bifida*; *SAY, Het. Hem. Indiana, pp. ? (a) *Ptochiomera* t. *nodosus*, *Cylapus* t. *tenuicornis*. (β) *Pamera* n. n. for *Pachymerus*, 1825 [male *Pachy-*

¹ = *stricknocera*, Fieb.

² Homotyp. *Ploiaria*, 1787.

³ = *domestica*, Scop.

⁴ Co-extensive with several previously described genera, there used as subgenera.

⁵ = *terreus*, Schrank.

⁶ Homotyp. *Pyrrhocoris*, 1814.

⁷ = *Corizus*, 1814.

⁸ Preocc. Latr. 1809.

⁹ = *Geocoris*, 1814.

¹⁰ All undescribed, and to me invalid.

¹¹ = *schillingi*, Schilling.

¹² = *Reduvius*, 1775.

¹³ Preocc. Meig. 1822.

¹⁴ = *pedicellata*, Kirby.

¹⁵ Preoccupied.

¹⁶ These twelve genera are to me invalid, not being described.

¹⁷ = *Edessa*, 1803.

mera]. (δ) *Corixia*, 1762; BRULLE, Comm. Sci. Morée Ins. 68-80. (δ) *Oelia*, 1803; LAPORTE, Ann. Soc. Ent. France, i. 95-8. (β) *Heteronotus*; HAHN, Wanz. Ins.] Aug.] i. 37-80. (β) *Cymus*. (γ) *Heterogaster*, 1829, t. *urticæ*; [Nov.] i. 81-118. (α) *Myrmus* t. *miriformis*; Jalla t. *dumosa*; *Halticus* t. *pallicornis*; ¹⁸ *Attus* ¹⁹ t. *pulicarius*. (β) *Arma*; *Rhynarius*; ²⁰ LAPORTE, Ann. Soc. Ent. France, i. 221-31. (α) *Poiocera* t. *luczoti*; *Germaria* ²¹ t. *cucullata*; ²² *Schizia* t. *servillei*; *Atypa* t. *gibba*; *Pterygia* ²³ t. *macquarti*; *Sphæronotus* ²⁴ t. *globularis*; *Cyphonia* t. *ornata*. ^{24a} (β) *Acanthicus*; ²⁵ PERCHERON in Guérin's Mag. Zool. pl. 48, pp. 1-2. (α) *Cephalelus* t. *infumatus*. (δ) *Cicus*, 1829; WESTWOOD in Gray's Griffith's Cuvier's An. Kingd. xv., Ins. ii. 216-64. (α) *Urophora* ²⁶ t. *hardwickii*; *Orthorapha* t. *cassidioides*; LAPORTE, Ann. Soc. Ent. France, i. 386-415. (α) *Raphirhinus* t. *adscendens*; ^{26a} LAPORTE, Mag. Zool. i. Suppl. 1-88. (α) *Harpactor* t. *angulosus*; ²⁷ *Prionotus* ²⁸ t. *serratus*; ²⁹ *Hexatoma* ³⁰ t. *marginalis*; ³¹ *Leptomeris* t. *picta*; *Macrophthalmus* ³² t. *pallens*; *Triatoma* ³³ t. *gigas*; ³⁴ *Lophocephala* t. *guerini*; *Prostemma* ³⁵ t. *guttula*; *Discomerus* ³⁶ t. *erosa*; *Mononyx* t. *raptoria*; *Diplonychus* t. *rustica*; ³⁷ *Sphærodema* t. *rotundata*; *Stenopoda* t. *cinerea*; ³⁸ *Micrellytra* t. *apterus*; ³⁹ *Meropachus* t. *nigricans*; *Pachymeria* ⁴⁰ t. *armata*; *Acanthocephala* t. *compressipes*; ⁴¹ *Leptoscelis* t. *hæmorrhoidalis*; *Microtoma* ⁴² t. *echii*; *Næogeus* t. *erythrocephalus*; ⁴³ *Aphanus* t. *roland*[r]i; *Eurycephala* t. *luteicollis*; ⁴⁴ *Odonotopus* t. *scarpunctatus*; *Meganotus* ⁴⁵ t. *apterus*; *Stenodema* t. *virens*; *Menenotus* t. *lunatus*; *Hymeniphora* t. *crucifer*; *Chariesterus* t. *gracilis*; ⁴⁶ *Chondrocera* t. *laticornis*; *Atractus* ⁴⁷ t. *cinereus*; *Phyllo-morpha* t. *histris*; ⁴⁸ *Zosmenus* ⁴⁹ t. *maculatus*; *Eurycera* ⁵⁰ t. *nigricornis*; ⁵¹ *Pedeticus* t. *marmoratus*; ⁵² *Piestosoma* ⁵³ t. *depressus*; *Brachyrynchus* t. *orientalis*; ⁵⁴ *Dryptocephala* t. *brullei*; *Disco-*

¹⁸ = *apterus*, Linn.

¹⁹ Preocc. Walck. 1805.

²⁰ = *Anthocoris*, 1814.

²¹ Preocc. Desv. 1831.

²² = *marmorata*, F.

²³ Preocc. Boit. 1798.

²⁴ = *Bocydium*, 1829.

^{24a} = *trifida*, Fabr.

²⁵ Preocc. Spin. 1829 [nymph-stage of Centrotine genus].

²⁶ Preocc. Desv. 1830.

^{26a} = *phosphorea*, Linné.

²⁷ By error *angulatus* (see p. 88).

²⁸ Preocc. Lacép. 1802.

²⁹ = *carinatus*, Forst.

³⁰ Preocc. Latr. 1809.

³¹ = *tipuliformis*, Fab.

³² Preocc. Latr. 1829.

³³ Altered invalidly on p. 77 to *Conorhinus*.

³⁴ = *rubrofasciatus*, De Geer.

³⁵ Homotyp. *Nabis*, 1802.

³⁶ Homotyp. *Syrtsis*, 1803.

³⁷ On p. 83 *rustica* is said to be a *Sphærodema*.

³⁸ = *culiciformis*, Fabr.

³⁹ = *fossularum*, Rossi.

⁴⁰ Preocc. Steph. 1829.

⁴¹ = *latipes*, Drury.

⁴² Altered invalidly on p. 84 to *Polyacanthus* (the last preocc. Kuhl, 1831).

⁴³ = *pusillus*, Fall., var.

⁴⁴ = *atrata*, Goez.

⁴⁵ Homotyp. *Pyrhcoris*, 1814.

⁴⁶ = *armatus*, Thunb.

⁴⁷ Preocc. Wagl. 1828.

⁴⁸ = *laciniata*, De Vill.

⁴⁹ = *Piesma*, 1825.

⁵⁰ Homotyp. *Copius*, 1822.

⁵¹ = *cornutum*, Thunb.

⁵² = *fasciata*, H.-S.

⁵³ = *Aradus*, 1803.

⁵⁴ = *membranaceus*, Fabr., var.

cephala t. *marmorea*; *Phyllocephala* t. *senegalensis*; *Aspongopus* t. *janus*; *Oncomeris* t. *flavicornis*; *Eurydema* t. *oleracea*; *Brachystethus* t. *marginatus*; ⁵⁵ *Flusthenes* t. *robusta*; *Atelocera* t. *armata*; *Megarhynchus* ⁵⁶ t. *elongatus*; ⁵⁷ *Odontotarsus* t. *purpureolineatus*; ⁵⁸ *Eurygaster* t. *hottentota*; ⁵⁹ *Trigonosoma* t. *nigelle*; ⁶⁰ *Agonosoma* ⁶¹ t. *flavolineata*; *Calidea* t. *signata*; *Podops* t. *inuncta*; *Coptosoma* t. *globus*; ⁶² *Platycephala* t. *metallica*; *Oxynotus* ⁶³ t. *gibba*; *Odontoscelis* t. *fuliginosa*; *Hammacerus* t. *conspicillaris*; *Cimbus* ⁶⁴ t. *versicolor*; *Platymenis* t. *biguttatus*; *Tapeinus* t. *pictus*; *Apionomerus* ⁶⁴ t. *hirtipes*. ⁶⁵ (β) *Euryophthalmus*; *Spartocera*; *Rhaphigaster*; *Discocera*; *Stiretrus*; *Opinus*; ⁶⁶ *Graphosoma*; *Lasiocera*. ⁶⁷ (γ) *Halobates*, 1822, t. *micans*; *Pachylis*, 1825, t. *pharaonis*; *Anisoscelis* [recte *Anisoscele*], 1825, t. *foliaceus*; *Stenocephalus* [recte *Stenocephale*], 1825, t. *nugax*; *Nematopus* [recte *Nematope*], 1825, t. *nervosus*; *Leptocoris* [recte *Leptocorise*], 1825, t. *linearis*; *Acanthocerus*, 1805, t. *sanctus*; *Monanthia*, 1825, t. *echii*; *Heteroscelis*, 1829, t. *servillei*; *Megymenum*, 1830, t. *dentatum*; *Peirates*, 1831, t. *stridulus*. ⁶⁸

1832-4. PERTY, Delect. 164-216. (α) *Scaptocoris* t. *castanea*; *Diactor* t. *elegans*; *Merocoris* t. *tristis*; *Platycoris* ⁶⁹ t. *varia*; *Storthis* ⁷⁰ t. *lividia*. ⁷¹

1833. CURTIS, Ent. Mag. [Jan.] i. 191-9. (α) *Eupteryx* t. *picta*; ⁷² *Amblycephalus* ⁷³ t. *viridis*; *Agallia* t. *consobrina*; ⁷⁴ *Megophthalmus* t. *bipunctatus*; ⁷⁵ *Phrynomorphus* t. *nitidus*; *Aphrodes* t. *testudo*; ⁷⁷ *Criomorphus* t. *albomarginatus*; *Galeatus* t. *spinifrons*; ⁷⁸ *Aspidotoma* ⁷⁹ t. *capitata*; *Pantilius* t. *tunicatus*; *Loricula* ⁸⁰ t. *pselaphiformis*; *Chlamydatus* t. *marginatus*; *Ilebrus* ⁸¹ t. *pusilla*. HAHN, Wanz. Ins. i. [Febr.] 119-58. (α) *Lopus* t. *hieracei*. ⁸² (β) *Lygus*. CURTIS, Brit. Ent. [May] 453. (α) *Coranus* t. *pedestris*. ⁸³ HAHN, Wanz. Ins. i. [June] 15-90. (α) *Ochetopus* ⁸⁴ t. *spinicollis*; ⁸⁵ *Strachia* t. *cruciger*. (β) *Hypsilonotus*. GERMAR, Rev. Ent. i. 174-84. (α) *Phenax* t. *variegata*; *Oxyrhacis* t. *tarandus*; *Paropia* ⁸⁶

⁵⁵ = *geniculatus*, Fabr.

⁵⁶ Preocc. Thunb. 1824.

⁵⁷ = *rostratus*, Fabr.

⁵⁸ = *grammicus*, Linn.

⁵⁹ = *fuscocucullatus*, Goetz.

⁶⁰ = *rustica*, Fabr.

⁶¹ Preocc. Guérin, 1830.

⁶² = *scutellatus*, Fourcr.

⁶³ Preocc. Raff. 1810.

⁶⁴ Usually ascribed to Hahn, 1831, q. v.

⁶⁵ *nigrilobus*, Stal.

⁶⁶ = *Tapeinus*, 1832.

⁶⁷ On p. 50 = *Holoptilus*, 1825.

⁶⁸ = *hybridus*, Scop.

⁶⁹ Preocc. Guérin, 1830; altered in 1834 to *Homalocoris*.

⁷⁰ Homotyp. *Dryptocephala*, 1832.

⁷¹ = *brullei*, Lap.

⁷² = *atropunctata*, Goeze.

⁷³ Homotyp. *Tetigonia*, 1762.

⁷⁴ = *puncticeps*, Germ.

⁷⁵ = *scanicus*, Fall.

⁷⁶ = *Aphrodes*, 1833.

⁷⁷ = *albifrons*, Linn.

⁷⁸ = *angusticollis*, Reut.

⁷⁹ Homotyp. *Piesma*, 1825.

⁸⁰ Preocc. Cuv. 1829.

⁸¹ Homotyp. *Næogus*, 1832.

⁸² = *thunbergii*, Fall.

⁸³ = *subapterus*, De Geer.

⁸⁴ Homotyp. *Pygolampis*, 1817.

⁸⁵ = *denticulatus*, Germ.

⁸⁶ Homotyp. *Megophthalmus*, 1833.

⁸⁷ Preocc. Perty, 1830-2.

^{87a} = *bonellii*, Latr.

t. scanica. (β) *Stegaspis*; *Smilia*; *Hoplophora*; ⁸⁷ *Dictyophara*, *Bythoscopus*, *Acucephalus*, ⁷⁶ *Combophora*, *Hemiptycha*, *Entylia*, *Lamproptera*, *Typhlocyba*. (γ) *Bocyidium*, 1829, *t. globularis*. (δ) *Ptyela*, 1825; *Smarris* for *Scaris*; WESTWOOD, Mag. Nat. Hist. vi. 228-9. (α) *Aphelocheirus t. æstivalis*; DUFOUR, Ann. Soc. Ent. France, ii. 104-18. (β) *Xylocoris*; LAPORTE, Ann. Soc. France, ii. 251-3. (α) *Caliscelis t. heterodoxa*; ^{87a} CURTIS, Brit. Ent. [Aug. 1st] 465. (δ) *Pyrrhocoris*, 1814; HAHN, Wanz. Ins. i. [Sept.] 191-236. (α) *Leptocoris t. rufus*; ⁸⁸ ii. [Nov.] 1-32. (α) *Corecoris* ⁸⁹ *t. cinnamomeus*; *Colliocoris* ⁹⁰ *t. griseus*. ⁹¹ (β) *Rhynocoris*.

(To be continued.)

NOTES AND OBSERVATIONS.

SELENIA TETRALUNARIA (ILLUSTRARIA) IN SCOTLAND.—I see that Mr. C. G. Barrett, in his 'Lepidoptera of the British Islands,' with regard to *S. tetralunaria*, so far as Scotland is concerned, merely states that "In Dr. Buchanan White's 'List of Scottish Lepidoptera' this species is recorded as occurring at Rannoch, Perthshire, but no particulars are given, and confirmation seems desirable." I conclude from this that records of this species in Scotland are desired, and I have much pleasure in placing on record the fact that on April 25th this year I bred a fine male specimen from a larva taken by me last September near Dunkeld, Perthshire.—FRANCIS C. WOODBRIDGE; Northcroft, Cornwall Road, Uxbridge, Middlesex.

ZONOSOMA PENDULARIA IN OCTOBER.—At the end of October last I bred a specimen of *Z. pendularia* from a larva taken by me in the preceding August at Kingussie, Inverness-shire; I took other larvæ of this species at the same time as that which emerged in October, but the imagines from them have not yet appeared. Is it not somewhat unusual for *Z. pendularia* to appear in October? My pupæ are all kept in an outhouse, and the October specimen could not have been forced in any way.—FRANCIS C. WOODBRIDGE.

A CORRECTION.—The drawing that I exhibited at the meeting of the South London Entomological and Nat. Hist. Society on February 14th represented a variety of *P. bellargus*, and not of *P. icarus* as stated in the report of that meeting (*ante*, p. 134).—C. W. COLTHRUP, 127, Barry Road, East Dulwich.

THE PAIRING OF EUCHLOË CARDAMINES.—In a lane near here, a female specimen of *E. cardamines* was seen, settled and perfectly quiescent, on a flower-head of hedge-garlic mustard, when a male specimen, flying down the lane, made straight for the female, and pairing instantly ensued. A note was made of the occurrence, it being most unusual, in my experience, for butterflies to pair at such

⁸⁸ = *abdominalis*, Fabr.

⁸⁹ = *Spartocera*, 1832.

⁹⁰ Homotyp. *Coranus*, 1833.

⁹¹ = *subapterus*, De Geer.

short acquaintance, and with no previous courtship, and seems specially interesting in view of Prof. Meldola's experiences recorded *ante*, p. 128. R. M. PRIDEAUX; Reigate, Surrey, April 23rd, 1901.

THE BUFF VARIETY OF *AMPHIDASYS BETULARIA*.—I have lately been looking over some of the back volumes of the 'Entomologist,' and was much interested in the notes on pages 113 and 162 of vol. xxii. (1889), on the subject of the buff variety of *Amphidasys betularia*, which was bred in the Middleton district in the seventies, inasmuch as I have a specimen of this variety in my collection. This insect came to me through a dealer, who informed me that it was from the Manchester district, bred about 1878, and I think, after reading Mr. Thorpe's remarks (Entom. xxii. 163), that it is most probably one of those specimens formerly belonging to Jonathan Fielding, which Mr. Thorpe says he (Fielding) exchanged with a London dealer for foreign butterflies for "picture making." "Manchester district" would, I take it, include Middleton. As this form seems to have disappeared entirely for the last twenty years, it would seem desirable to place on record the existence of any specimens which remain.—H. AINSLIE HILL; 9, Addison Mansions, Kensington W., May 15th, 1901.

[I have a pair of this curious variety of *A. betularia*. They were formerly in Mr. Carrington's collection, and he, I believe, obtained them from a London dealer.—R. S.]

CAPTURES AND FIELD REPORTS.

NOTE ON *VANESSA POLYCHLOROS*.—On one of the last days of April this year I saw two specimens of *Vanessa polychloros* on Walton Heath, and two others near Betchworth; several others may or may not have been these over again. It is many years since I last saw this butterfly alive in England.—T. A. CHAPMAN; Betula, Reigate, May, 1901.

NOTE ON *VANESSA POLYCHLOROS*, &c.—Hybernated specimens of this butterfly seem unusually plentiful this year in our neighbourhood. I have observed it on the following dates: April 1st, 7th, 8th, 19th, and May 1st. On April 19th I worked for it, and came upon a regular swarm at the side of a copse near Holmbury St. Mary, and took as many as I wanted for ova. *V. urticae* is plentiful, but not so plentiful as *V. polychloros*; and I have seen two specimens of *V. io*. *Lycæna argiolus* is out in some numbers on Holmwood Common.—F. A. OLDAKER; Parsonage House, Dorking, May 1st, 1901.

NOTIDOBIA CILIARIS.—On May 5th this caddis-fly was out in good numbers on the herbage along the bank of the canal near Byfleet. Having but recently emerged, the wings had not lost their full black colour, and I noticed that several females were carrying a yellow mass of eggs attached to the apex of the abdomen (*vide* E. M. M. vol. i. p. 216, 1865).—W. J. LUCAS; 28, Knight's Park, Kingston-on-Thames.

EARLY DATE FOR *ANAX IMPERATOR*.—Rev. F. A. Walker, D.D., reports the capture of a female of this magnificent dragonfly on May 11th at West Heath, Hampstead. The earliest date previously noticed was of a speci-

men taken by Mr. C. A. Briggs on May 15th, on Ockham Common, in the particularly early season of 1893.—W. J. LUCAS; Kingston.

EASTER (1901) IN THE NEW FOREST.—The forest half under water, and scarcely any sallows in bloom, was the state of things we found on arrival at Brockenhurst on April 4th. Up to the 7th the weather was most depressing, and collecting either impossible or very unpleasant. A few fine mornings, however, improved things wonderfully, and the results of a week's collecting were fairly satisfactory. When sufficiently sunny and tempting, hibernating butterflies abounded—*Eugonia polychloros* and *Gonepteryx rhamni* being especially common, whilst a fair number of *Aglais urticae* were seen. *Brephos parthenias* was fairly common among the birches, but was, as usual, not easy to catch, though a few specimens were obtained. They suddenly disappeared on the 11th, though perhaps the most favourable day for their flight; whether or not the heavy rain and violent winds had finished them off I do not know, but not one was to be seen. One rather worn example of *Asphalia flavicornis* was found hanging like a leaf from a low birch-twigg. *Xylocampa lithorhiza* scarcely seemed so common as in the two previous years, though three examples were found on one birch-trunk. I have noticed in three Easters at the forest that this insect is nearly always on birch- and fir-trunks, generally very low down, and not in places where the trees grow thickly together. A single very fresh-looking *Xylina rhizolitha* was taken from a fir-trunk. A nice variable lot of *Tephrosia bistortata* was obtained, principally from larch and fir, but a few from oak-trunks. Two very fine specimens of *Lobophora lobulata* were netted, showing the delicate green tinge of freshly emerged examples of this species. A few odd examples of *Anticlea badiata*, *Hybernina marginaria*, *Anisopteryx æscularia*, and *Hypena rostralis* (1), and one or two larvæ of *Bombyx trifolii* and *Noctua neglecta* (?), complete the day-work. At night treacle produced a nice variable series of *Tæniocampa munda*, but little else; *Cerastis vaccinii* (very abundant), *Scopelosoma satellitia*, *Tæniocampa stabilis*, and *T. cruda*. The sallows, once found, proved productive. *Tæniocampa stabilis* and *T. cruda* swarmed. A few *T. munda* were taken, but this species prefers treacle. *T. gothica*, not very abundant. *T. miniosa*, a few quite fresh, apparently only just emerging. I was pleased to meet with *T. instabilis*, as I had not previously taken it in the forest, and made a comment in my last Easter notes on its apparent local scarcity (Entom. xxxiii. 206). Mr. E. R. Banks also contributes a note (Entom. xxxiii. 349) with reference to my query. Only four specimens were taken, but all in perfect condition. Single examples of *Pachnobia rubricosa*, *Xylina rhizolitha*, *X. socia*, and *Trachea piniperda* were also taken. No doubt we did not visit the right part for the last-named insect, which I believe was common enough in the locality we worked last year. *Cerastis vaccinii* and *Scopelosoma satellitia* were common, and a few *Xylocampa lithorhiza* turned up. *Anticlea badiata*, *Cidaria psittacata* (one), *Larentia multistrigaria*, *Anisopteryx æscularia*, and *Eupithecia abbreviata* were also taken at the sallows. On the wing, or at rest on twigs, *Anticlea badiata*, *Hybernina marginaria*, and one *H. rupicaprararia* were taken.—F. M. B. CARR; 46, Handen Road, Lee, S.E.

ISCHNURA PUMILIO IN CORNWALL.—In the 'Entomologist' for February, p. 53, I see that both Mr. Dale and Mr. Lucas have made mention of the dragonfly (*Ischnura pumilio*) as having been taken near Land's End in

1864. It may interest them to know that I took, on June 10th, 1900, a male *I. pumilio*, and on June 17th a male and female, at a pond midway between Penzance and Land's End; but, I am sorry to say, that when on the setting-board drying, their abdomens were attacked by wasps, and partially eaten. There is not the least doubt about the identity of the specimens, as I do not know another species amongst the small blue fry that has the nervures of the wings of a red-brown when fresh caught like *I. pumilio*. They were easily named from the illustration in Mr. Lucas's splendid work on the Odonata. The wings and thorax were not damaged, so I have kept the remains; but I have not them here at Mansfield. I left them behind me at Porth Enys Museum, Paul, near Penzance, where I spend most of the season.—WILLIAM DAWS; 39, New Wood Street, Mansfield Notts.

[From a further communication received from Mr. Daws, there seems no doubt that his captures are *I. pumilio*; he has had some years' experience with the Odonata, and would not be likely to confuse *I. pumilio* with *I. elegans* when making a careful examination of the fresh specimens, as he was able to do in this case. Mr. Daws hopes to take the species again during the present season.—W. J. L.]

MARGARODES UNIONALIS IN HAMPSHIRE.—A specimen of *M. unionalis* was taken on Sept. 21st, 1900, at a lamp in the Sea Road, Boscombe.—THEODORE H. ROBINSON; Serampore, Boscombe, Hants.

[This species has been taken at Forest Hill, Gravesend, Deal, Brighton, Isle of Wight, Gosport, Torquay, and Tresco. Its occurrence in Britain was first noted in 1859, and the last capture that we are aware of previous to that now recorded by Mr. Robinson was made at Gosport in 1884 (*vide* Entom. xxiii. 277.—ED.)

PLUSIA MONETA IN NORTH LONDON.—I have the pleasure to record the finding yesterday of larvæ of *Plusia moneta* feeding on *Aconitum* in a garden here. I have not heard of its capture in this district previously.—V. E. SHAW; 8, Moss Hall Grove, North Finchley, N., May 24th, 1901.

OPORABIA AUTUMNARIA IN DELAMERE FOREST.—Two specimens I took in the forest some time ago have been identified by Mr. L. B. Prout. They have hitherto occupied a place in my collection as doubtful varietal forms of *O. dilutata*. The locality for the species is not new, as it was known to Mr. Gregson many years ago.—J. ARKLE; Chester.

EARLY APPEARANCE OF HYDRILLA PALUSTRIS AT CARLISLE.—While collecting near Carlisle on May 20th last I netted a fine male *Hydrilla palustris* flying along a hedge about 9.10 p.m.—J. E. THWAYTES; 8, Clement Place, Carlisle.

LYCÆNA ARGOLUS AND OTHER INSECTS IN MAY.—I noticed this species flying about Snargate Street, Dover, in the morning of May 2nd. In the afternoon I returned to town, and in the afternoon of the following day (May 3rd) I noticed it again in a Kingsbury lane leading down to Hendon. I may also mention that while at Dover my daughter noticed *Gonepteryx rhamni*, and I also observed the following species: *Pieris rapæ*, *Vanessa io*, *V. urtica*, the last named species in very good condition for presumably hibernated specimens. I was informed by Mr. F. W. L. Sladen, the well-known hymenopterist of South-east Kent, that *Vanessa polychloros* was very common on the downs this season, though not usually abundant in that

locality, but as hybernated somewhat the worse for wear. Between Arch-cliff Fort and Shakespeare's Cliff I captured *Bombus terrestris*, *Anthophora pilipes*, *Andrena albicans*, *A. pilipes*; and of Diptera, also on the West Cliff, *Bibio marci* and *B. hortulanus* were observed.—(Rev.) F. A. WALKER; Dun Mallard, Cricklewood, N.W.

ERRATA.—Page 161, lines 21 and 23, for "birch" read "beech."

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—April 3rd, 1901.—Mr. Charles G. Barrett, Vice-President, in the chair.—Mr. Albert Piffard, of Felden, Boxmoor, Herts, and Mr. Percy Lathy, of Lyndon Villa, Sydney Road, Enfield, were elected Fellows of the Society.—Mr. Goss read a letter from the Right Hon. Charles Ritchie, Secretary of State for the Home Department, conveying the King's thanks for the loyal and dutiful address of the Fellows of the Entomological Society of London, expressing their sympathy with His Majesty and the Royal Family on the occasion of the lamented death of Her late Majesty Queen Victoria.—The Rev. A. E. Eaton sent for exhibition, on behalf of Mr. F. M. Halford, a female sub-imago of a species of Ephemeriadæ, of the genus *Ephemerella*, received from Central Africa, without more precise indication of locality, the first time this genus has been noticed from Africa. Mr. McLachlan remarked that *Ephemerella* usually occurred in cold alpine or temperate regions, and that the Central African example probably inhabited the mountains at a considerable altitude.—Dr. Chapman exhibited cases of *Luffia ferchaultella* from Cannes, and a spider, which are found on the same rocks, the interest of the specimens being in the fact that the spider, when at rest, has almost precisely the same form and coloration as the cases of the moth.—Mr. W. L. Distant communicated a paper entitled "Enumeration of the Heteroptera (Rhynchota) collected by Leonardo Fea in Burma and its vicinity."

May 1st.—The Rev. Canon W. W. Fowler, M.A., in the chair.—Mr. C. G. Barrett exhibited, for Mr. H. W. Vivian, a specimen of *Xylophasia lateritia*, Hufn., a species not hitherto recorded in the British Islands, taken in South Wales by Mr. W. E. R. Allen; also *Deiopeia pulchella*, from the same district; *Diantheia luteago* var. *barrettii*, from one of the islands off the Glamorganshire coast; and varieties of *Eupithecia virgaureata*, much blackened, *E. lariciata*, *E. satyrata*, and *E. exiguata*, taken in the county of Glamorgan by Mr. Vivian.—Mr. M. Jacoby exhibited specimens of *Helicopriss gigas*, L., from Mashonaland, and *Silpha biguttata*, Fairm., from Patagonia.—Sir George Hampson exhibited two females of an apterous Lasiocampid from the Transvaal, with cocoon and ova bred by Colonel J. M. Fawcett, 5th Lancers. The larva is very much like that of the British *Lasiocampa rubi*. The female does not emerge from the cocoon, its antennæ being aborted and all the joints coalesced with a flabellate organ with slight striæ indicating the joints; the fore tibiæ short, with traces of tibial claws. The male is unknown, and as Colonel Fawcett was on active service at the time of emergence, he was unable to expose the

female for the purpose of attracting the male.—Mr. H. St. J. Donisthorpe exhibited specimens of *Rippersia tonliui*, Newst., a coccid new to Britain, taken among *Lasius niger* at Portland in April, 1900. The species, which is myrmicophilous, was first discovered in Guernsey.—Mr. C. P. Pickett exhibited aberrations and varieties of *Lycæna bellargus*, *L. corydon*, and *L. astrarche*, taken by him in August, 1900, at Folkestone and Dover.—Mr. H. Goss exhibited a gynandromorphous specimen of *Lycæna bellargus*, which he had taken at Reigate in June, 1900. It had the characters of a male in the right wings, and the characters of a female in the left wings, which were, however, not entirely free from the blue scales of the male. No dissection had been made of the genitalia, so it was impossible to say whether the specimen was strictly hermaphrodite.—Dr. Chapman exhibited a cocoon of *Antheraea mylitta*, and a flint from Redhill—two objects with practically nothing in common. Whilst dissenting *in toto* from those who see nothing in many cases of mimicry but accidental resemblance, he presented them with this as a case undoubtedly in accordance with their views, the cocoon and the flint being remarkably alike.—Professor Poulton exhibited an apparatus invented by him to determine the strength of the formic acid shot out by the ant in defence of its nest. Mr. Donisthorpe, he said, had noticed that a shower of formic acid had sometimes a great effect, and he thought it would be interesting to decide the quantity of anhydrous acid. In the case of *Dicranula vinula*, the fluid, which contains forty-five per cent. of acid, was painful in the eye, but did not damage the skin or body. He considered that the acid was only virulent during the time that the larvæ and pupæ were in the nest, and that it was used purely for defensive purposes.—Mr. F. Enock exhibited specimens illustrative of the metamorphoses of dragonflies. Mr. F. Enock read a paper entitled “The Metamorphoses of *Æschna cyanea*, illustrated by the electric lantern with photographs taken from life.” Sir George Hampson, Bart., communicated a paper on “The classification of a new family of the Lepidoptera”; Mr. Martin Jacoby, a paper entitled “A further contribution to the knowledge of African Phytophagous Coleoptera”; Messrs. Gilbert and J. Arrow, a paper entitled “The Carabid genus *Pheropsophus*; notes and descriptions of new species.”—H. ROWLAND-BROWN, *Hon. Sec.*

SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—February 28th, 1901.—Mr. H. S. Fremlin, F.E.S., President, in the chair.—Mr. F. N. Clark exhibited a specimen of *Pieris rapa*, which emerged indoors on February 22nd.—Mr. McArthur, an example of *Arctia caia*, with smoky hind wings. It emerged in December, 1890, and was one of a third brood.—Mr. Harrison, a long and varied series of *Luperina testacea* from Wallasey, among them being two examples of the var. *nigrescens*.—Mr. Edwards, pieces of chestnut branches, showing the ravages of the larvæ of *Zeuzera pyrina*, a species doing considerable damage at the present time in the London parks and squares.—Mr. Main, a Mantis from West Africa, having large ocellated markings on the fore wings (*Harpax*?).—Mr. Montgomery, photograph of a large larva breeding-house and a number of cages for rearing Lepidoptera, to illustrate his paper on “The Breeding of Lepidoptera,” where he detailed his methods of obtaining ova, of keeping young larvæ,

of treating hybernating larvæ, and of keeping pupæ. A considerable discussion took place, several members giving their own experience and the methods they had found successful in rearing Lepidoptera.

March 14th.—The President in the chair.—Mr. Colthrup, a long series of females of *Polyommatus icarus* and *P. bellargus*, most of which showed a considerable amount of the male coloration. Several of the former were prettily splashed with white. They were all from Eastbourne.—Mr. Routledge, a moth which he supposed to be a male of *Hydrilla palustris*. It was taken near Carlisle by Mr. Thwaites with a net whilst sugaring on June 10th, 1899. Several members doubted its identity, but could not tell what species it was.—Mr. Harrison, a long series of *Aplecta nebulosa* from Delamere Forest, including var. *robsoni*, and a specimen of *Xylophasia monoglypha* var. *athlops* taken at the same time and place.—Mr. Adkin, a long bred series of *Caradrina ambigua*, which emerged in December, and read notes on the habits and food of the larvæ.—Mr. McArthur, preserved larvæ of *Abraaxas grossulariata*, *A. ulmata*, and *Pachnobia alpina*, with a specimen of *A. ulmata* taken near Brighton some fifty years ago. He stated that the latter species was not again taken in the district till some sixteen years ago, when it was found, locally, in some numbers.—Mr. Kirkaldy, specimens of the lantern flies, *Pyrops candelarius* and *P. maculatus*, and contributed notes as to their protective resemblance to their surroundings.—Mr. Burr called attention to the evasive habits of some British grasshoppers; large active males would leap and fly, heavy females would burrow, while the smaller individuals would run round the stems.—Mr. Manger, a large number of exotic dragonflies.—Mr. Turner, a microscopic slide showing fossil remains in limestone from Montgomeryshire.

March 28th.—The President in the chair.—Mr. Sich exhibited specimens of *Goniodoma limoniella* (*auroguttella*), and stated that the larva quits the case when about to pupate; the following species of the genus *Coleophora*, *C. deauratella*, *C. frischella*, *C. alcyonipennella*, *C. ochrea*, *C. vibicella*, and *C. salicorniæ*, of which the last named also quits the case to pupate, together with specimens of *Gelechia tenebrella*, which bears a close superficial resemblance to *C. alcyonipennella*.—Messrs. Harrison and Main, series of early spring Geometers taken this year in Delamere and Epping Forests. Among them was a specimen of *Nyssia hispidaria*, taken in the former place.—Mr. West (of Streatham), pieces of amber containing Homopterous and Dipterous insects.—Mr. R. Adkin, specimens of *Acherontia atropos* bred from larvæ taken in Huntingdonshire, and read notes on the forcing of the species, especially calling attention to the internal appearance of the pupæ which failed to emerge. A discussion ensued, and various other methods of forcing were described.—Mr. Montgomery, a larva of *Charaxes jasius* sent to him from Cannes, with a *Gordius* worm which had extruded from it.—Mr. Bishop read a paper on "The Natural History of the Guildford District."

April 11th.—The President in the chair.—Mr. Carpenter exhibited a large number of specimens of *Pieris napi*, bred from one batch of ova. Half the specimens had emerged in June and early July, while the remainder emerged the following April and May. The former were very uniform, while the latter were very variable in the female

specimens. He also showed a long series of bred *Melitaa aurinia* from Penarth and Carlisle.—Mr. McArthur, bright and well-marked specimens of *Plutella annulatella* from the Orkneys.—Mr. Fremlin, a number of specimens of Lepidoptera and other insects taken during a short trip to Canada in 1900, and read notes.—Mr. Lucas, the species of Odonata taken by Mr. Fremlin at the same time, including species of the genera *Sympetrum*, *Libellula*, *Gomphus*, *Æschna*, and *Agrion*.—HY. J. TURNER, *Hon. Rep. Sec.*

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.—*April 15th*, 1901.—Mr. R. Wilding in the chair.—Minutes of the preceding meeting were read and confirmed.—Mr. Wilding again thanked the St. Helen's members who had done so much to make the previous meeting a success. He afterwards referred to the death of Mr. Robert Brown, one of the oldest members, who, although his special study was botany, had always taken an interest in the doings of the Society.—The Rev. R. Freeman proposed that the Society adjourn until October. Dr. J. Cotton seconded, but suggested that a field meeting should be held in June at Delamere. The Secretary was deputed to make preliminary arrangements.—Mr. C. E. Stott, of Bolton, communicated a paper by Mr. F. H. Day, of Carlisle, entitled "Notes on the Coleoptera of the Cumberland Mountains," in which he gave accounts of the rarer and more interesting of the beetles which find a home on the slopes of Seawfell and its neighbours. Mr. Wilding, who read the paper, said that the species were identical with those of the Welsh mountains,—that he had taken many of the insects named on the slopes of Snowdon and the hills around Llangollen; thus affording another proof that when the localities are similar the insect faunas are alike also, though perhaps two hundred miles apart. A discussion on these points was carried on by the Chairman, Messrs. Freeman, Burgess-Sopp, Pierce, Cotton, and Birch, after which the following exhibits were examined:—Mr. Day's case of specimens illustrating his paper, which included that burnished gem *Carabus nitens*, an insect made resplendent by its coppery thorax and metallic green elytra; *C. glabratus*, *C. arvensis*, *Pterostichus athiops*, *Aphodius lapponum*, and many other rarities, by Mr. C. E. Stott. *Bembidium nigricorne* and *Philonthus quisquiliarius*, the latter new to the Liverpool fauna, by Mr. Wilding. *Spongiphora therminieri*, a remarkable Orthopteron from Espirito Santo, by Mr. Burgess-Sopp. *Phygadeuon pedaria* and *Acalla literana*, by Mr. A. Tippins.—FREDERICK BIRCH, *Hon. Sec.*

BIRMINGHAM ENTOMOLOGICAL SOCIETY.—*March 18th*, 1901.—Mr. G. T. Bethune-Baker, President, in the chair.—Mr. J. T. Fountain showed a series of *Callimorpha hera* taken in Jersey last year, also living larvæ of the same. He had found a batch of the eggs on a leaf of ivy, and had succeeded in getting some of the larvæ thus far through the winter, and they had now become active. He referred to the habits of various hibernators in the spring, and said that he had often seen the larvæ of *Arctia caia* in the early spring on posts, &c., in the sunshine, having apparently come up to sun themselves, and that they went down again as soon as the sun went in; he had also seen the pupæ of *Bombyx rubi* come up to the top end of their cocoons in sunny weather, also apparently to feel the warmth of the sun.—Mr. R. C. Bradley exhibited

Mutilla europæa (males), and *rufipes* (females), taken at Bournemouth last summer.—Mr. C. J. Wainwright, various Hymenoptera, including a series of the rare Chrysid, *Cleptes pallipes*, from West Runton, Norfolk, and *Osmia aurulenta* and other bees from Selsley, Glos.

April 15th.—The President in the chair.—Mr. R. C. Bradley showed a few Lepidoptera taken last year, including *Colias edusa*, *Aspilates citraria*, &c., from Bournemouth, and *Catocala nupta* from Swanage.—Mr. G. W. Wynn, a series of *Callimorpha hera* taken by Mr. E. A. Rogers near Dawlish, ranging from yellow through intermediates to red forms. Also a series of *Spilosoma lubricipeda* var. *radiata*, bred from ova received from Mr. W. Tunstall, of Huddersfield.—Mr. J. T. Fountain, a number of insects taken by himself in Jersey last summer, including *Colias edusa* var. *helice*, very fine *Satyrus semele*, and the Diptera *Asilus crabroniformis* and *Volucella zonaria*, the latter being a very fine Syrphid not yet known as British.—Mr. A. D. Imms, various Lepidoptera, including *Polia flavicincta*, from Northampton, where he had found it very abundant at sugar, and *Sphinx convulvuli*, from Moseley.—Mr. G. T. Bethune-Baker, *Vanessa urticae*, with all its geographical forms and races, including vars. *ichnusa*, *polaris*, &c.; also specimens of *Colias edusa*, for comparison, with a purple gloss on their wings.—Mr. Colbran J. Wainwright, Diptera; the two British species of *Sepedon speigeus* from Sutton Park, and *spinipes* from Chalford, Glos., and three species of *Limnia marginata* from St. Ives, Cornwall, and West Hide, Herefordshire; *rufifrons* from West Hide, and West Runton, Norfolk; and *ungrucornis* from West Runton and Sutton Park, where this latter species is abundant.—Mr. A. H. Martineau, the six species of the *helvola* group of the genus *Andrena*, in order to point out the very slight distinctions between them=*apicata*, Smith, *lapponica*, Bett., *helvola*, L., *ambigua*, Perkins, *fucata*, Smith, and *varians*, Rossi.—COLBRAN J. WAINWRIGHT, *Hon. Sec.*

RECENT LITERATURE.

W. B. BENHAM. "Note on *Cordyceps sinclairii*, Berkeley." (1900. Trans. New Zealand Institute, xxxii, pp. 4-8, plate I.)

THERE is a genus of fungi containing a number of species parasitic on insects.* During the ultimate nymphal instar, spores of the fungus, giving rise to thread-like hyphæ, enter the tissues of the living insect to make their way in all directions, gradually replacing the living tissues, and, of course, occasioning the insect's death. Some of the hyphæ, in order to disseminate the future spores, push their way, as a compact bundle, through the skin of the insect, growing upwards into the air. A well-known example is *C. hugelii* (= *robertsii*), the New Zealand "Vegetable Caterpillar." In the present paper, Benham notices a species (*C. sinclairii*) attacking the nymph of *Cicadetta* (or, as he calls it, "*Cicada*"), a genus of Cicadidæ strongly represented in Australia and New Zealand. The fungus "issues between the head and the pronotum. The main branch grows straight forward for some

* Benham says "confined to insects," but a little later notes that the scydalian stage may occur on bark leaves, &c.

distance, and gives off branches right and left in a very characteristic fashion."

"The two different modes of spore-formation yield different kinds of spores—(1) *Ascospores*, formed by subdivision of the protoplasm inside a single cell or 'ascus'; (2) *Conidiospores*, formed by constriction of a hypha, so as to form a row of spores arranged more or less like a string of pearls or beads." The remarkable fact is that while *C. hugelii* (the "Vegetable Caterpillar") is known only in its ascospore stage, it is only the conidial stage of *C. sinclairii* that is known. Both stages are known in some European species, the conidial stage not necessarily growing on an insect (but sometimes on leaves, bark, &c.), so that possibly the two New Zealand forms may be merely links in the life-history of one species of *Cordyceps*.

G. W. K.

Die Dermapteren und Orthopteren von Österreich-Ungarn und Deutschland. Bearbeitet von JOSEF REDTENBACHER. Wien: 1900.

WITH present-day British authors, the Dermaptera (Earwigs) are usually looked upon as the first division (*Forficularia*) of the Orthoptera; but Redtenbacher, on the other hand, looks upon them as a distinct order, naming the rest Orthoptera genuina. Leach also early in the nineteenth century gave the Earwigs ordinate rank under the name of Dermaptera, which name, however, De Geer had previously proposed for the whole of the Orthoptera. Leach's estimate of the position of this interesting group of insects has found favour with a number of British authors, who have treated them with the same distinction as Redtenbacher.

Thirteen Earwigs are enumerated, *Forficula lesnei* and *Apterygida arachidis* not being amongst them; but the latter has been recorded from two localities only in Britain, and those not out of doors.

Of the Cockroaches there are sixteen in all, including five species of the genus *Aphlebia*, which so far is unrepresented in Britain, and five of the genus *Ectobia*, the three British species being amongst them. The British casuals—*Nyctibora holosericea*, *Rhyparobia maderæ*, *Leucophæa surinamensis*, and *Blabera gigantea*—are not mentioned, while *Blatta australasiae* is not given a recognised position.

In Britain the Mantids and Phasmids are unrepresented; but for Germany and Austria Redtenbacher is able to give four of the former, including *Mantis religiosa*, and one of the latter.

Of the Grasshoppers proper we have in Britain eleven species, in addition to about five casuals, amongst these five being the "locusts" that occasionally reach our shores. In Germany and Austria there are seventy-one. Of the Locustids there are eighty-nine as against our nine. Of Crickets there are seventeen to our four.

The book, which is in German, is a large octavo of 148 pages, in paper covers, and is printed in large clear type. One lithographic plate of details constitutes, unfortunately, the whole of the illustrations. There is but little introduction, and the descriptions and notes on each species are short. The work takes the form of a synopsis, and therefore appeals to the specialist rather than to the general reader.

W. J. LUCAS.

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[No. 458.

NAMES AND DEFINITIONS OF HYBRIDS.

By T. A. CHAPMAN, M.D., F.E.S.

Ent. Record, vol. xiii. p. 183; Dr. Standfuss, "Experiments on Hybridization," reprinted from the 'Entomologist,' pp. 23 and 34. These two recent items remind me of a simple expedient for defining hybrids that, I imagine, must have occurred to someone and been adopted, yet Dr. Standfuss's unwieldly notation, that compels him to use a number in the text, and his reader to refer back to pp. 23 and 34 to see what the number means, implies that it has not been adopted, or probably proposed. The idea simply is to abbreviate the name of the insect as much as possible, often to an initial, and to place the two names thus abbreviated together, the male always first. Thus, if dealing with Saturnias, as on Dr. Standfuss's p. 23, his most complicated cross, No. 18, which he writes:—

$$\text{Sat. } \frac{\left(\frac{\text{pavonia } \sigma}{\text{spini } \varphi} \right)}{\text{pavonia } \varphi} \sigma$$

would be written Sat. Pa S. Pa Pa—Pa S. Pa Pa, or simply Sat. Pa S Pa Pa Pa S Pa Pa. A hybrid being always designated by its 2, 4, 8, 16, or more parents. This one is a little complicated by having to write Pa, to distinguish *pavonia* from *pyri*.

Similarly Dr. Standfuss's No. 30—

$$\text{Pyg. } \frac{\left(\frac{\text{curtula } \sigma}{\text{anachoreta } \sigma} \right)}{\text{anachoreta } \varphi} \sigma$$

would be written Pygæra C.A—A.A—A.A—A.A. If *P. anastomosis* comes into the experiment, then *Ac* must be used for *anachoreta*, and *As* for *anastomosis*.

The advantages of this notation are that it can be easily written in the text, and conveys at once to the eye the ancestry and constitution of the form before us.

NEW AND LITTLE-KNOWN BEES FROM NEBRASKA.

By T. D. A. COCKERELL.

THE following bees were kindly communicated to me by Mr. J. C. Crawford, Jun., and Prof. L. Bruner :—

Perdita affinis, Cresson.—West Point, Aug. 12th, 1900 (J. C. Crawford). Both sexes at flowers of *Solidago rigida*. New to Nebraska.

Perdita albipennis, Cresson.—Lincoln, Aug. 17th, 1900 (J. C. Crawford). Both sexes at flowers of *Helianthus annuus*.

Perdita bruneri, Ckll.—West Point, Aug. 6th, 1900 (J. C. Crawford). Two females at flowers of *Grindelia*; one is larger than usual.

Perdita perpallida, n. sp.—Lehigh, July (Cary). Both sexes at flowers of *Petalostemon*.

Length about 6 mm., very pale yellowish, colour of *P. woottonæ*, but without any black patch on pleura in either sex. Female with legs entirely pale, but male with a large black patch on inner side of anterior femora beneath. Male flagellum pale orange, not marked with black above. Stigma very pale yellow, nervures colourless. Abdomen entirely without bands. Ocelli black, but no black lines on vertex in either sex.

Perdita crawfordi, n. sp.—Lincoln, Nebr., Aug. 25th, 1900 (J. C. Crawford). Male at sunflower; female at *Grindelia*.

♂. Length about 5 mm.; head and thorax dark bluish green; head ordinary; cheeks with a short tooth on lower part; front, vertex and cheeks with short white hair; vertex minutely granular; antennæ dark brown above, very pale beneath; clypeus and lateral face-marks cream-colour; clypeus wholly pale except the usual dots; lateral marks transversely oblong, not quite reaching the level of the upper edge of the clypeus, the inner side bulging above, and thus larger than that adjacent to the eye; no supra-clypeal or dog-ear marks; thorax rather abundantly clothed with white hairs; no light markings on prothorax or pleura; wings milky-hyaline; nervures white, stigma faintly yellowish; marginal cell nearly squarely truncate, the sub-stigmatal portion about as long as the post-stigmatal; second sub-marginal cell greatly narrowed above; third discoidal cell only faintly indicated; legs black, knees, anterior tibiæ in front, and the tarsi, pale

yellowish; abdomen shining piceous, without light markings, but the hind margins of the segments hyaline.

♀. Length 5 mm.; similar to the male, but the lateral face-marks are nearly equilateral triangles; and the second, third, and fourth abdominal segments have basal straight pale yellowish bands, narrowly interrupted in the middle, and those on the third and fourth segments terminating abruptly some distance before the lateral margins.

In my tables of *Perdita*, the male runs to *P. vagans*, and the female to *P. bigeloviae*; but the face-markings are not as in those species, and other differences are apparent on comparison.

Perdita maura, n. sp.—Cedar Bluffs (L. Bruner). Both sexes at flowers of *Aster*.

♂. Length about $4\frac{1}{2}$ mm.; head and thorax dark bluish-green, metathorax blue; abdomen broad, shining black without marks, the hind margins of the segments not hyaline. Head ordinary, cheeks unarmed; face-marks yellow; clypeus yellow except the sides above, and the whole of the upper median margin, the yellow therefore occupying all the lower half of the clypeus, and sending a broad tongue upwards in the median line; supra-clypeal mark divided into two adjacent patches; no dog-ear marks; lateral face-marks broadly triangular, their upper angles (of about 45°) about level with the antennal sockets; scape and flagellum dark brown above and yellow or brownish yellow beneath; face not hairy; mesothorax granular, with feeble punctures, median groove very distinct; thorax with sparse short hair; wings hyaline, nervures and stigma very dark brown, third discoidal cell ill-defined; marginal cell ordinary; legs black, knees, anterior tibiae and tarsi, and middle tibiae and tarsi, more or less yellow.

♀. Length about $5\frac{1}{2}$ mm.; similar to the male, except as follows: face wholly dark, but the mandibles are yellow with dark ferruginous tips; third discoidal cell distinct; anterior tibiae behind, and middle tibiae, black.

P. maura in my tables runs in the male to *P. asteris*, var., but it is quite distinct from that species, which has milky wings with almost colourless nervures and stigma. The female runs in the neighbourhood of *phymatæ*, but that is a much smaller and less bulky insect.

Spinoliella australior (Ckll.), Sioux Co. (L. Bruner). Both sexes at *Cleome* flowers. New to Nebraska.

East Las Vegas, New Mexico, U.S.A.:
Nov. 14th, 1900.

SIX NEW SPECIES OF CULICIDÆ FROM INDIA.

BY LT.-COL. G. M. GILES, M.B., F.R.C.S., I.M.S.

(Communicated by F. V. Theobald, M.A., F.E.S.)

CULEX TRITÆNIORHYNCHUS, sp. n.

Wings unspotted. Tarsi minutely basally banded, pale ochreous. Thorax unadorned, fuscous. Abdominal segments fuscous, with rather narrow yellowish white basal bands. Proboscis with three ochreous bands.

A minute species of generally dusky tinting and proportionately long legs. Head fuscous; eyes with a barely perceptible whitish margin; nape fuscous, with a few whitish hairs. Antennæ fuscous, minutely banded white in the male. Proboscis fuscous, with three separate ochreous bands, one forming the tip; the second sharply defined, and much broader beyond the middle; the third less sharply defined, especially in the female, midway between the large band and the base. Palpi (male) considerably longer than the proboscis, exceeding it by more than the length of the markedly subulate terminal joint, fuscous, with minute white basal bands to the last three joints; female exceptionally minute, nearly black, with an indistinct greyish tip. Thorax fuscous, with golden brown tomentum, unadorned. Wings hyaline, with nearly black scales. Axillary vein joining costa a little in front of base of anterior fork-cell, and slightly behind tip of anterior branch of five longitudinal; supernumerary and middle transverse veins in one line, and fully their united length outside the posterior transverse. Fork-cells both narrow and of nearly equal width, but the anterior the longer; their stems short, the posterior being a little the longer, so that the base of the corresponding cell is slightly outside that of the anterior fork-cell. Halteres pale yellow. Legs fuscous; the tarsi with minute ochreous basal bands to all the joints; first post-tarsal joint longer than the corresponding tibia in both sexes. Abdomen fuscous, with rather narrow yellowish white basal bands to the segments, broader in the middle than laterally, especially on the anterior segments. Length of wing of male 2.4 mm., of female 3 mm.

Hab. Madras.

CULEX PSEUDO-TÆNIATUS, sp. n.*

Wings unspotted. Tarsi black, with white rings formed on the bases and apices of contiguous joints. Thorax black, elaborately adorned with fine white lines (almost as in *C. taniatus*,† Meig.). Abdominal segments black, with narrow basal bands; venter pale fawn. The general coloration is an intense violet-black.

This species bears a strong resemblance to *C. notoscriptus*, Skuse, and to *C. taniatus*, but may be easily distinguished by the position of the tarsal banding, and its wanting the white band on the proboscis of the former species.

* This comes in my genus *Stegomyia* (F. V. T.).

† This is synonymous with *Culex fasciatus*, Fabr. (F. V. T.).

♀. Head black, with a narrow median line on the nape, and the borders of the eyes snowy white. Antennæ dark brown, slightly shorter than the proboscis, which is black throughout. Palpi about one-fifth the length of the proboscis, black with white tips, and some white spotting at the articulations. Thorax black, elaborately adorned with very narrow white lines, consisting of a median, bifurcating behind, two short straight anterior lateral lines, and outside these a pair of long sigmoid-curved lines, in the external hollow of which are yet another pair of slightly curved lines, occupying the two middle fourths of the area. The posterior border of the metanotum is armed with strong bristles. The wings much resemble those of *C. albopictus*,* and are fully the length of the abdomen, hyaline, the veins clothed with linear black scales; axillary vein joining the costa a little before the tip of the posterior branch of fifth longitudinal, and just short of the base of the anterior fork-cell; supernumerary and middle cross-veins nearly equal, joining at an oblique angle; each rather longer than the posterior transverse, and placed twice the length of the latter outside it, and nearly opposite the tip of the sixth longitudinal; posterior transverse placed less than one-third along the anterior branch of fifth longitudinal; anterior fork-cell longer and slightly narrower than the posterior, their bases nearly opposite. Legs black, with delicate white lines on the sides of the femora and tibiæ, but no distinct knee spots; the tarsal joints have minute white bands both at base and apex, combining to form a still narrow ring on the articulation, that on base of first tarsal joint often involving the tibia; in the fore legs the upper two, in the middle the upper three, and in the hind all articulations are so ringed. Abdomen black, with very narrow basal white bands of perfectly uniform width, so that it is easy to mistake their position, and to take them as on the hinder border of segment. They are best marked in the third, fourth, fifth, sixth segments; the first abdominal segment has the dorsum covered with a peculiar beak-like backward-projecting plate of the scutellum, armed with a radiating tuft of strong bristles. Length of wing, 8.1 mm. male to 5 mm. female.

Hab. The Lower Himalayas, 6000–8000 feet (Bakloh'n Punjab, and Naini Tal). Not common, but occasionally enters houses and bites.

I have met with the larvæ in very shallow depressions in the cemented gutter round a house, in the bottom of which was only a little sand just tinted with green algæ, in perfectly clean rain-water. They are about 8 mm. long, and very dark tinted, the head being so black that the eyes cannot be distinguished. The antennæ are very short, and, with the exception of some terminal specialized short bristles, are almost naked, and not, as usual, indistinctly two-jointed, with tufts at the constriction. The spiracle is extremely short, not half as long as the anal tubercles, and no longer than an average abdominal segment. With the exception of the large thoracic tufts, the bristles are not distinguishably compound. In the water they hold themselves

* This is synonymous with Walker's *C. scutellaris*; both come in my new genus *Stegomyia* (F. V. T.).

nearly vertical to the surface. The pupæ are also intensely black.

CULEX GUBERNATORIUS, sp. n.*

Wings unspotted. Tarsi each with two bands, one at the base of the first, the second over articulation between first and second joints. Thorax sooty, with a round anterior median and four lateral snowy spots at the corners of the notum. Abdominal segments black, with large snowy lateral spots, and a minute terminal median spot on the last; venter sooty.

♀. Head sooty black, the nape with a minute median line, a delicate border to the eyes, and a pair of small lateral spots behind them snowy white. Antennæ, proboscis, and palpi entirely black, the former with the second no longer than the succeeding joints. Thorax sooty, with snowy spots arranged as below; in front there is a large median spot, which is prolonged at the sides into a pair of lateral bars, in front of which are scarcely perceptible separate humeral spots; there is a similar pair of short lateral transverse bars at the posterior corners of the notum, besides which the pleuræ and coxæ are plentifully speckled. The posterior border of the metanotum is armed with three tufts of bristles. Wings hyaline, the veins with black scales; auxiliary vein joining the costa a little external to the middle transverse vein; second longitudinal vein springing from the first only a trifle internal to the posterior transverse; supernumerary and middle transverse veins in one line; together not much longer than the posterior transverse, and placed distinctly more than their united length outside it; anterior fork-cell somewhat longer and narrower than the posterior, but having a somewhat longer stem, which is about two-thirds as long as the cell. Halteres with white stems and black knobs, their roots protected by distinct membranous tegulæ. Legs black, with the exception of a fairly broad white band at the base of the posterior femora, and smaller patches on the under surface of the other femora; there are large white knee spots, and two broad bands, one placed on the base of the first tarsal joint and apex of the tibia, and the second on the apex of first and base of the second tarsal; in the fore legs there is a faint ring on the next articulation. Abdomen sooty black, each segment having a pair of broad lateral basal snowy spots. There is also a minute median spot on the dorsum of the last visible segment. Venter uniformly sooty black, Length of wing 3 mm.

Hab. Taken in Government House, Allahabad.

CULEX PULCHRIVENTER, sp. n.

Wings unspotted. Tarsi unbanded, black. Thorax golden scaled, with a fine median and broader lateral black lines. Abdominal segments black, with snowy basal bands, and the venter elaborately adorned with golden, snow-white, and black markings.

Head black, with two bands of golden tomentum separated by a delicate median black line on the nape, and a delicate line of golden scales round the eyes; on the sides behind the eyes are two minute patches of white scales. Antennæ almost two-thirds the length of the

* This is a *Stegomyia* (F. V. T.).

proboscis in the male, black with black verticils; in the female the internodes are covered with whitish down; on the upper surface of the basal joint is a patch of whitish scales; second joint short. Proboscis sooty black throughout. Palpi of male but four-fifths the length of the proboscis, tapered, their terminal joints much the smallest in all dimensions; black, saving a few scattered yellowish hairs on the second joint, and a very minute yellow ring at the base of the second; in the female they are very minute, and have also a few scattered yellow hairs on the apex and base of the penultimate joint. Thorax covered with golden tomentum, through which the bare black ground shows to form black lines. On the anterior two-thirds is a large triangular golden area, divided into lateral halves by a delicate median black line; behind and external to this is a fairly broad V-shaped black mark, the limbs of which taper off in front, and at the back of the thorax laterally is yet another pair of somewhat reniform bare black marks; the golden scales are narrow and hair-like throughout, and behind develop into bristles, which project backward from the border of the metanotum in three strong tufts. The pleuræ and coxæ show a few patches of silvery scales, and there is a strong tuft of yellow hairs at the root of the wings. Wings dusky, the veins densely clothed with linear sooty-black scales. Axillary vein joining the costa midway between the supernumerary cross-vein and the base of the anterior fork-cell; supernumerary and middle cross-veins joining at a very open angle, placed a little outside the tip of the sixth longitudinal, and almost twice the length of the distinctly longer hinder cross-vein external to it; anterior fork-cell longer and somewhat narrower than the posterior; their stems about equal, the stem of the anterior being just half the length of its cell. Halteres with white stems and black knobs. Legs sooty black throughout, save for the golden lower surfaces of the femora; a distinct knee spot and a few stray bristles of the same colour on the other joints. In the male the anterior and middle legs have strong symmetrical tarsal claws, each with two accessory spines; those of the hind legs are small, symmetrical, and simple. Abdominal segments black, with narrow snowy basal bands, consisting of a pair of crescentic spots narrowly connected across the middle line, the hinder and lateral borders of the segments showing some golden hairs. Ventrally the abdomen is elaborately adorned, each of the five middle segments showing behind a large lunate golden area, bounded in front by a narrow sooty line which touches the segment in front of it in the middle line, and so separates a pair of triangular snowy patches at the sides of their bases; the anterior and hinder segments are almost purely white. Length of proboscis 3 mm.; of male palpi 2.6 mm.; of antennæ 2 mm.; of wing (female) 5 mm.

Hab. Naini Tal. Is essentially a sylvan species, though I have taken a specimen in the verandah. The larvæ are found in pools in the course of the (perfectly clean) fresh water surface drainage system, through which in heavy rain a perfect torrent of water flows. They are darkly tinted, about 8 mm. long when mature, and have a short spiracle, no longer than the last two abdominal segments, and but little longer than the anal papillæ.

The head is yellow at the sides. The pupæ are large and nearly black. I have not been able to induce imagines, newly escaped, to bite.

TÆNIORHYNCHUS AGER, sp. n.

Wings unspotted. Tarsal joints deep brown, with ochreous bands at base and apex, so that two joints combine to form rings at the articulations. Thorax unadorned, black, covered with mingled black and golden scales. Abdominal segments black, with distal ochreous bands. Proboscis black, with two ochreous bands at the tip and in the middle.

♀. Head black, with scattered golden scales. Antennæ dark brown, with a minute yellowish ring round the insertion of the second joint, which latter is no longer than the succeeding joints. Proboscis deep brown, with a broad sharply defined ochreous band in the middle of its length, and a second narrower one at its tip. Palpi about one-fifth the length of the proboscis, black, with a minute yellowish tip. Thorax black, covered with a shaggy tomentum of mingled black and golden scales; there are three groups of bristles on the posterior border of the scutellum, but they are only of moderate lengths. Wings hyaline, the veins clothed with alternatively black and yellow scales. Axillary vein joining the costa a little internal to tip of anterior branch of fifth longitudinal, while latter is opposite the base of the anterior fork-cell. Supernumerary and middle transverse veins joining at an open angle, and placed rather more than the length of either external to the posterior transverse, all three being of about equal lengths; the two fork-cells are of about equal width, but the anterior is much the longer, its stem being slightly shorter than that of the posterior, and less than a third the length of the cell. Legs dark coloured, clothed with a mixture of black and golden scales, the former preponderating except on the under surface of the femora; tarsi nearly black, with narrow ochreous bands at base and apex of the joints, which, combining, form five more or less distinct rings, placed on the articulations with the exception of the uppermost ring, into the formation of which the tibiae do not enter. There are also more or less distinct ochreous knee spots. Abdomen nearly black, the segments having distinct ochreous bands on their hinder borders, broader laterally than in the middle, so that the dark portions form a series of lunate spots, the yellow bands almost combining laterally; there are seven distinct bands, the last visible segment being entirely yellow. Length of wing 4 mm.

Hab. Travancore, Madras Presidency.

CORETHRA ASIATICA, sp. n.

A single female was taken on the wall of my dining-room at Shahjahanpur, N. W. P., under a lighted lamp. It is a minute but proportionally stoutly-built gnat. From the configuration of the wing I should have been inclined to place it in *Mochlonyx*, but the first tarsal joint, although barely half length of tibia, is longer than the second tarsal. Hence I place it in *Corethra*.

It is uniformly pale straw-colour throughout. Very hirsute. Body

and legs armed with hairs, the veins of the wings alone being scaled, and even these are long and narrow, approximating to hairs; those of the internal fringe being exceptionally long. The proboscis is very short, darker than the rest of the body, very short, and bilobed. Palpi short and slender, but longer than the proboscis; antennæ not banded. Thorax indistinctly marked with a darker median line in front, tapering to disappearance behind. Outside this are lines composed of minute black dots formed by the roots of hairs, and external again to these, and behind, two pear-shaped brown spots. These markings all pertain to the ground colouring, and are not produced by tomentum. Wing broad internally. Auxiliary vein joining the costa far out and beyond the tip of anterior branch of fifth longitudinal. Fork-cells with their bases opposite, and their stems nearly half as long as the branches of the anterior fork, which is much longer and narrower than the posterior; supernumerary middle and posterior transverse veins of about equal length, the two first in one open-angled line; the last just internal to the other two, and distinctly external to tip of sixth longitudinal vein. Halteres white, with a round black dot on the end of the knob. Legs rather short and stout, very hirsute, the first tarsal joint barely half the length of the tibia, but longer than the second tarsal; uniformly pale straw-colour. Abdomen of the same tint as the rest of the body, saving a few irregular brownish specks along the sides.

Shahjahanpur: Jan. 8th, 1901.

A PRELIMINARY LIST OF THE LEPIDOPTERA OF WEI-HAI-WEI.

BY THOMAS BAINBRIGGE FLETCHER, R.N., F.E.S.

(Concluded from p. 174.)

Fam. LIMACODIDÆ.

*Parasa consocid*⁹, Walk.—Common at light in July.

Fam. NOTODONTIDÆ.

*Phalera flavesce*⁹s, Brem.—One specimen, at light on board, 22nd July, 1898.

Phalera fuscipennis, Butl.—Several, at light on board, 20th and 21st July, 1898. In repose, this species tucks in its head and imitates a bit of dead stick, just like our own familiar *P. bucephala*.

*Cerura mencia*⁹na, Moore.—A male and female, on mainland, 15th May, 1899. Judging by the large number of empty cocoons on the willows around Flagstaff Camp, this species must be fairly common. The limpet-shaped eggs furnish rather a good example of protective resemblance. Above, they are of a dull salmon colour, and would evidently resemble small galls or patches of fungi, when viewed on the leaf; whilst below they are green, and so show very little when viewed through the leaf.

Melalopha (= *Ichthyura* = *Pygæra*) *anachoreta*, Fb.—Several on willows around Flagstaff Camp, 25th April, 1899.

Fam. SPHINGIDÆ.

Macroglossa stellatarum, L.—Common throughout the whole of the warm season.

Chærocampa elpenor, L.—One specimen, at Chifu, 8th May, 1899.

Chærocampa japonica, Bdv.—One specimen, at light on board, in July, 1898.

Leucophlebia lineata, Westw.—One specimen, at light on board, 20th July, 1898.

Daphnis hypothous, Cram.—One only, 23rd June, 1898, attracted by the search-light when we were doing "night-firing," about ten miles off Wei-hai-wei. This species seems a straggler from the Tropics, as the British Museum specimens are from much more southern localities—Sarawak, Labuan, &c.

Phlegethontius convolvuli, L.—Common in September and October. Abundant all round the gulf of Pechili in 1898. (*Vide* 'Entom. Record,' vol. xi. p. 110.)

Smerinthus planus, Walk.—Two specimens, caught on the mainland on 16th July, 1898, and brought to me.

Fam. SATURNIDÆ.

Actias selene, L.—One, on the mainland, 15th May, 1899.

Antheræa pernyi, G.-M.—This occurs in a half-wild state almost everywhere. The larvæ are found on the dwarf oak-bushes, being collected by the natives when full-grown for the silk, which forms one of the industries of the district, Chifu silk being very well known. When irritated, the larva tucks in its head and assumes a pseudaposematic appearance by exposing the eye-like mark on the fourth segment; this gleams like silver in the sunshine, and looks like a lurid eye. The moth appears in March and April, and again in July.

Fam. LASIOCAMPIDÆ.

Dendrolimus pini, L. (= *Metanastria segregata*, Butl.).—Abundant in July and August. The larvæ occur in thousands on fir-trees in May, and are full-fed about the middle of June. On 7th June, 1899, I went over to the mainland in hopes of getting cocoons, but, though I found the larvæ in plenty and enormous in size, I could not see any which had pupated. The larvæ occur in two distinct shades—orange and grey. When annoyed, they eject a clear watery liquid, and curl their heads down, thus prominently exposing the big blue hairy tufts composed of short easily-detachable bristles. If further annoyed, they lash about with their fore extremity, and try to bring these tufts in contact with the aggressor. This I permitted one to do to my finger, when it left a number of short blue hairs embedded in the skin. These hairs, which are also woven into the texture of the cocoon to form a regular *cheveux-de-frise*, are not easily extracted from the skin, but break off, leaving the points embedded, and, I have no doubt, would prove highly urticative to persons with a tender skin. On 4th October, 1899, I note: "The small fir-bushes are covered with ova of *D. pini*,

most of which have hatched out, the young larvæ being now about half-an-inch long.

Fam. ZEUZERIDÆ.

Trypanus (= *Cossus* = *Xylentes*) *vicarius*, Walk.—Common in June and July, 1898. As almost the only trees at Wei-hai-wei are willows, the conditions are favourable to the maintenance of the species; hence it is not surprising that the average size of the specimens is much greater than usual, equalling, indeed, that of our own *T. ligniperda*.

NOCTUÆ TRIFIDÆ.

Fam. AGROTIDÆ.

Acronycta rumicis, L.—One, on a willow near Flagstaff Camp, 25th April, 1899.

Leucania unipuncta, Haw.—Common in June. On the afternoon of 7th June, 1899, I saw this species flying in hundreds around flowers.

Mamestra abjecta, Hb.—One specimen, at Chifu, 9th May, 1899.

Mamestra adjuncta, Stdgr., ab. *mongolica*, Stdgr.—One specimen, at Chifu, 9th May, 1899.

Agrotis segetis, Gmel.—One only; Chifu, 5th May, 1898. Disturbed from short grass amongst the sand-hills; its colour agrees very well with that of the sand.

Peridroma (Agrotis) ypsilon, Rott. (= *suffusa*, Hb.).—Common in June.

Fam. HELIOTHIDÆ.

Heliothis dipsacea, L.—One specimen, at Chifu, on 5th May, 1898, flying round flowers in the afternoon.

Heliothis armigera, Hb.—One at Chifu, to light on board, 4th May, 1898.

Heliothis scutosa, Schiff.—Common in Leu-kung-tao on 12th June, 1898. Readily disturbed from amongst bushes; the only one I saw on the wing of its own accord in the day-time was feeding on a thistle flower.

Fam. ACONTIDÆ.

Erotyla (Agrophila) trabealis, Scop. (= *sulphuralis*, L.).—One specimen, at the eastern end of Leu-kung-tao, 10th June, 1899. This specimen agrees very well with one from Pekin in the National Collection.

NOCTUÆ QUADRIFIDÆ.

Fam. PLUSIDÆ.

Plusia ni, Hb.—Fairly common in September and October.

Plusia gutta, Gn.—Common in October.

Fam. CALPIDÆ.

Calpe excavata, Butl.—One only, in Leu-kung-tao, 14th June, 1898.

Fam. HYPOPYRIDÆ.

Spiramia simplicior, Butl.—Common in May and again in August. Has a great liking for cultivated ground. It is very wary and, once

disturbed, difficult to capture. The colours, though so varied, match the bare earth very well when it is settled with wings outspread.

Fam. OPHIDERIDÆ.

Ophiodes tirhaca, Cram.—One, at light on board, 22nd October, 1898.

Eliasma narcissus, Cram.—One specimen only, in Leu-tung-tao; found drying its wings on 12th November, 1898. The examples in the National Collection appear to have been captured earlier in the year, between June and August, so possibly this belongs to, at any rate a partial, second brood.

Fam. LAGOPTERIDÆ.

Lagoptera juno, Dalman.—Common at the beginning of September.

GEOMETRÆ.

Fam. IDÆIDÆ.

Craspedia kaschmirensis, Moore. Common in May.

Fam. ACIDALIIDÆ.

Timandra amataria, L.—One specimen, at light on board, 29th September, 1898.

PYRALES.

Fam. PYRALIDIDÆ.

Cledeobia bombycalis, Schiff.—Two specimens, at the eastern end of Len-kung-tao; one on 28th May, 1898, the other on 24th May, 1899; it flies rapidly in the hot sunshine, and has a jerky flight. This seems a well-marked local race, if not a new species. The *bombycalis* in the National Collection are from Sarepta, Austria, and Buda. My specimens are much darker. The central portion of the fore-wings between the light transverse fasciæ is dark, and not light, yellowish-brown. The discoidal spot is also almost obsolete (quite obsolete in one), whereas in the type it is very prominent. The base of the hind-wings inside the yellowish fascia is in *bombycalis* quite light, but in the Wei-hai-wei specimens as dark as the outside portion. For this darker variety I propose the name *chinensis*.

Aglossa pinguinalis, L.—One specimen, at light on board, 18th July, 1898.

Nomophila noctuella, Schiff.—Common in May and again in October. The depth of ground-colour is very variable, and this is doubtless of use to the species, as it is in the habit of settling on the bare earth. It is noticeable that *Spirania simplicior* (*ante*, p. 199), which has much the same habits, also varies very greatly in depth of ground-colour, from grey to black.

Fam. HYDROCAMPIDÆ.

Nymphula fenquehanalis, Pryer.—One specimen, at Chifu, in September, 1898.

H.M.S. 'Gladiator,' Mediterranean.

DIPTERA AND HYMENOPTERA IN NORFOLK.

BY COLBRAN J. WAINWRIGHT, F.E.S.

I SPENT three weeks last summer at West Runton, Norfolk, collecting insects, and some account of the species obtained there may be of interest. The village lies between Cromer and Sheringham, on the north coast, and is at the foot of a range of hills running parallel with the seashore, and about a mile or more away from it. These hills are richly clothed with woods, with pleasant open spaces, and everywhere while we were there was a great wealth of flowers of all kinds, so that the many flower-loving species of Diptera and Hymenoptera might be expected in numbers. The soil was dry and sandy, and very suited to the burrowing Aculeates, and, generally speaking, I should think it a favourable spot for the entomologist. I had a great deal of my three weeks spoilt by rain and wind, but succeeded in obtaining a very fair lot of insects. Mr. R. C. Bradley joined me for a few days in the middle, but was unfortunate in the weather, and obtained little that I had not already taken. He has already referred to a few of the Diptera we obtained in the E. M. M. for January.

Among the Hymenoptera, several species of *Andrena* were conspicuous: *tridentata*, Kirb., *nigriceps*, Kirb., and *coitana*, Kirb., were all very abundant on ragwort bloom; on the same flowers also occurred, in similar abundance, *Nomada solidaginis*, Panz., and *Colletes fodiens*, Kirb. So numerous were these species of bees that it was only necessary to sweep a bed of the flowers to get a net full of the insects, from which one could choose at will the specimens preferred. Amongst the *nigriceps*, one specimen of *simillima*, Sm., occurred. The other species of *Andrena* I took were *bimaculata*, Kirb., of which I obtained three specimens on bramble blossom; *cetii*, Schr., eight specimens on a few odd flowers of scabious, which was not a common flower there; and *gwynana*, Kirb., second brood (= *bicolor*, Fab.). Other bees which occurred were *Colletes succincta*, L., *Halictus rubicundus*, Chr., *cylindricus*, Fab., *albipes*, Kirb., *zonulus*, Sm., *Cilissa hæmorrhoidalis*, Fab., *C. leporina*, Panz., *Nomada obtusifrons*, Nyl., *Epeolus productus*, Thoms., common, burrowing in the sandy bank of a lane, where I found many of the Aculeates, also on ragwort, *Cælioxys elongata*, Lep., and *C. acuminata*, Nyl., both occurring on bramble blossom, the latter rather commonly, *Megachile maritima*, Kirb., three specimens only, *M. centuncularis*, L., *Anthidium manicatum*, L., and *Stelis aterrima*, Panz., the latter not uncommon on bramble blooms. A lane ran up the hill from the village into the woods, and, piercing the hill somewhat, left most attractive sandy banks, where many Aculeates were nesting. Many of the bees above mentioned occurred there,

burrowing or haunting the burrows of their hosts. *Cilissa* and *Epeolus* were specially abundant. There also many of the Fossores occurred, including *Astata boöps*, Schr., *Tachytes pectinipes*, L., *Pompilus viaticus*, L., *Ammophila sabulosa*, L.; and several species of *Crabro*—*4-maculatus*, Fab., *palmaris*, Schreb., *anxius*, Wesm., *panzeri*, V. der Lind, &c. One or two species occurred down close by the sea, on the flowery meadows at the top of the cliffs, and practically not at all higher up amongst the woods. *Andrena bimaculata* and *A. cetii* were only taken in these meadows; *Tiphia femorata*, Fab., I only obtained by sweeping there amongst the flowers; *T. minuta*, V. d. Lind, one specimen turned up amongst the *femorata* there; *Mellinus sabulosus*, F., was common on *Angelica* down by the shore. *Mimesa equestris*, F., occurred everywhere, but was in especial abundance on one little clump of the *Angelica* close by the shore; and a single specimen of *Nysson dimidiatus*, Jur., was obtained by sweeping on the cliffs. The following complete the list of Aculeates taken there:—*Myrmosa melanocephala*, F., *Pompilus niger*, F., *Trypoxylon figulus*, L., *T. clavicerum*, Lep., *Diodontus minutus*, F., and *D. tristis*, V. d. Lind, *Pemphredon lugubris*, F., *Crabro chrysostoma*, Lep., *C. cribrarius*, F., *Entomognathus brevis*, V. d. Lind, *Oxybelus uniglumis*, L., *Odynerus callosus*, Thoms., and *O. pictus*, Curt., and a few species of *Sphecodes* and *Halictus* still undetermined.

In the garden of the cottage where we stayed, the little chrysid *Cleptes pallipes* occurred upon the leaves of raspberry-canecanes. I obtained about a dozen specimens, only one, however, being a male.

The Diptera were not so numerous as the Hymenoptera, but yet I obtained some nice things amongst them, many of the best being obtained by sweeping, an excellent method for obtaining specimens, but one which gives very little opportunity of observing their habits. Mr. R. C. Bradley has already referred to some of the Trypetidæ we obtained. *T. cornuta*, F., was a specially striking capture. It is the largest and handsomest of the genus, and in life, before the lovely greens of its abdomen have all faded, it is a strikingly beautiful insect. It occurred in thousands on *Centaurea scabiosa*, but, alas, although I took many specimens and tried various methods of killing, I failed to preserve its colours. *T. tussilaginis*, F., and *Tephritis bardanæ*, Schrk., were equally abundant on burdock; indeed, the chief requirement in collecting species of this group seems to be to find the food-plant, when the flies will probably be found in attendance. Other species of this group obtained were *Spilographa alternata*, Fall.—one specimen on the raspberry leaves in the garden; *Urophora solstitialis*, L., common on *Centaurea nigra*; *Sphenella marginata*, Fall., which seems always common on ragwort; *Ensina sonchi*, L.; *Tephritis miliaria*, Schrk.; *T. tessellata*, Loew., a species not given in Mr. Verrall's list, but of

which I obtained five specimens by sweeping on the top of the cliffs; *T. vespertina*, Loew.; *Urellia eluta*, Meig., one specimen only—this species is in italics in Mr. Verrall's list; *U. stellata*, Fuessl.; *Pteropæctria frondescentiæ*, L.; and *Rivellia syngenesiæ*, Fab. Although the only water near consisted of tiny streams and small horse or duck ponds, yet I obtained a series of *Stratiomys chamæleon* on the flower-heads of *angelica*; and in the garden of the cottage, on the raspberries, *Oxycera pulchella*, Meig., occurred, but was difficult to capture, it was so skittish. I obtained some very good Muscidæ, Tachinidæ, &c., but these I have referred to elsewhere; and also the following among others—*Oncomyia atra*, F., *Physocephala rufipes*, F., *Anthrax paniscus*, Rossi, *Dysmachus trigonus*, Mg., *Chrysotoxum festivum*, L., *Actina tibialis*, Mg., and a great number of other species, many still unidentified, so that it is impossible to attempt a complete list of my captures in this order.

NOTES AND OBSERVATIONS.

GYNANDROUS SPECIMENS OF AMPHIDASYS BETULARIA.—From a batch of ova deposited by a New Forest female of *Amphidasys betularia*, taken in June, 1900, we have bred, during May this year, twenty-one males, forty females, and seven gynandrous specimens. One of the males has its antennæ only very slightly pectinated; otherwise both the males and the females are fairly normal in appearance, but hardly as large as the parents. Of the gynandrous specimens, four have male antennæ on the right, and three on the left side. The larvæ were kept indoors for a few days when newly hatched, and then sleeved on birch till full-grown. Is it not altogether unusual for such a number of gynandrous specimens to appear in one brood? With the idea of seeing if the tendency to produce these abnormal forms was continued in the ordinary specimens of the brood, an attempt was made to pair two of the latter, but it was unsuccessful, and unfortunately they were the last to emerge.—A. HARRISON; H. MAIN; 72, Windsor Road, Forest Gate, Essex.

THE BUFF VARIETY OF AMPHIDASYS BETULARIA.—In reply to Mr. Ainslie Hill (*ante*, p. 180), I do not think this form has disappeared for the last twenty years, except that there is no record of its having been bred; but during the lifetime of the late Mr. John Thorpe, he never seemed at a loss to produce specimens of the buff variety. Where did they come from? It is curious to note all the specimens are apparently bred; and Lancashire collectors could now produce this form without all the wonderful crossing mentioned (*Entom.* xxii. 163). Mr. Thorpe was connected with the cotton industry, in which large quantities of chlorine are used for bleaching purposes. All Messrs. Lomas and Fielding had to do was to rear and breed the *betularia* pupæ in the bleaching-room, when lo! and behold! buff vars. appeared,

80 per cent. and upwards, and alive too. Mr. Hill should try the experiment, and revive the long-lost variety; he could have a full series of nice fresh specimens instead of "a specimen" in his collection.—F. N. PIERCE; The Elms, Dingle, Liverpool, June 16th, 1901.

EUCHLOË CARDAMINES AT REST.—While "dusking" with the lantern in the New Forest at the end of May, a specimen of this butterfly was found at rest by Mr. H. Main on the partly uncurled tip of a frond of bracken, where it was extremely well protected by resemblance. A year or two since I recollect finding one in the same situation on Esher Common.—W. J. LUCAS; Kingston-on-Thames, June 6th, 1901.

HEMEROBIOUS CONCINNUS BRED.—Early in the spring I beat from *Pinus sylvestris*, on Esher Common, a number of yellowish larvæ mottled with a darker tint, rather under an inch long, which somewhat resembled larvæ of a ladybird, and which I took to be those of one of the Chrysopas. Several pupated, and the pupa, which seemed to be rather lively, was somewhat elliptical in shape, of much the same colour as the larva, but smaller, and was enclosed in a slight silken cocoon. Two produced imagines after a week or two at least—the exact time was not noticed. Finding that they were *Hemerobius concinnus*, a species not long since looked upon as decidedly scarce, I was sorry that I had not observed them more closely, and made figures of the larva and pupa.—W. J. LUCAS; Kingston-on-Thames.

COLIAS HYALE PUPA: A CORRECTION.—I am indebted to Dr. T. A. Chapman for calling my attention to a slip of the pen in my description of *C. hyale* pupa (*ante*, p. 171), where I stated that in the pupa the wings reach the division between the fifth and sixth abdominal segments, which should read the *fourth* and *fifth*, as is stated in my original description.—F. W. FROHAWK; June, 1901.

BERLIN CONGRESS OF ZOOLOGY.—The Fifth International Congress of Zoology will be held at Berlin, 12th–16th August next. Visits will be paid to the Museum and to the Zoological Gardens of Hamburg, and a trip will be made to Heligoland. Prof. Grassi of Rome will discourse on the Malaria-problem from the Zoological Standpoint; Prof. Poulton, of Oxford, on Mimicry and Natural Selection; and Dr. Forel, of Geneva, on Ants. For information, apply to "Praesidium des V. Internationalen Zoologen Congresses," 43, Invalidenstrasse, Berlin, N. 4.

PIERIS RAPE.—This species is spreading gradually in New Mexico. To-day a female specimen was taken in Las Vegas by Miss Teresa Long, one of my students.—T. D. A. COCKERELL; May 23rd, 1901.

NOTE ON THE OCCURRENCE OF PHYLLODROMIA GERMANICA, L., IN BIRMINGHAM.—Towards the latter end of May last I came across two female examples of this insect, one mature, and having an egg-capsule protruding from the genital pouch, and the other in the later nymph-stage. They were among some straw in a packing-case in the Botanical Laboratory of the Mason Science College (now the University). The case had been delivered from London, and contained German scientific apparatus. There are consequently two possible

sources whence the insects may have come to Birmingham—either from some warehouse in London, in many localities of which city the insect is well established, or by direct importation from the Continent. The fact that *P. germanica*, unlike *Stylopyga (Blatta) orientalis*, attains its full development in three or four months, and that one of the specimens taken was immature, seems to point to a probability that they were British “born and bred,” for the goods did not come direct from Germany, and moreover had been lying for nearly fourteen days in Birmingham before I observed the insect. As is well known, this species is practically cosmopolitan, but its true home seems to be the northern and more central portions of the Palearctic region. Sharp, quoting Brunner, says that it has been found in increasing numbers in Vienna, where it is displacing *orientalis*; but Miall (‘The Cockroach,’ p. 19) mentions that on the whole the latter species is dominant not only over *germanica*, but over the much larger *Blatta americana* as well. In this country the insect has established itself in a few localities only, mainly in the south-eastern counties. Burr (‘British Orthoptera,’ p. 24) gives London, Hastings, Folkestone, Aldershot, Bradford, and Bognor; while Miall (*loc. cit.*) also mentions Leeds. The egg-capsule has been described and figured by Riley (‘Insect Life,’ vol. ii. U. S. Agr. Dept.), as well as by Brunner, and therefore does not need any further description. I may add that Mr. W. J. Lucas has been kind enough to examine one of my specimens.—A. D. IMMS; “Linthurst,” Oxford Road, Moseley, near Birmingham.

CAPTURES AND FIELD REPORTS.

ISCHNURA PUMILIO IN THE NEW FOREST.—On May 27th and 28th this interesting little dragonfly was beginning to appear in the New Forest, and after lengthy search a few specimens were secured. From some points noticed while on the watch for the species, it may possibly be found that they breed in wet boggy ground rather than actually in water, as seems to be the case with *Orthetrum cærulescens*.—W. J. LUCAS; June 6th, 1901.

HESPERIA SYLVANUS.—I have recently read in ‘Butterfly and Moth Collecting’ (by G. E. Simms) that this species is very partial to “yellow gorse.” I should like to know if this has been generally noticed, as I have never seen the species on that plant, but invariably in or near woods, on brambles and bracken.—A. MARSHALL; Cranbrook, Kent, May 29th, 1901.

SMERINTHUS OCELLATUS.—A splendid specimen was captured last week, in a garden here, on a cabbage-plant.—A. MARSHALL; Cranbrook, Kent, May 29th, 1901.

ENTOMOLOGICAL NOTES FOR MAY, 1901.—From May 1st till the 15th *Lycæna argiolus* was very plentiful here, and in splendid condition. On May 13th and 14th a number of *Vanessa polychloros* larvæ emerged from the ova obtained during the latter part of April. On May 14th I took several specimens of *Thecla rubi* from an elder-flower. There were many elders about, and many flowers on this one shrub, but *T. rubi* seemed to prefer this particular blossom; I captured three specimens within two minutes.

This insect has been abundant on Ranmore Common, and generally in the neighbourhood in greater profusion than ever before during my experience. On May 15th I took a few specimens of *Nemeobius lucina*, but could not go for them again till the 21st, when I had the good fortune to take the male and female *in coitu*. I placed the female on a primrose under a cylinder, and by the 24th over fifty ova were laid on the under sides of the leaves, some singly, others in batches of three, five, and even ten. The young larvæ from these have appeared to-day, and have begun to eat, some on the upper and some on the under side of the leaf. On May 27th and 28th, I took some fine specimens of *Lycæna bellargus*; the former day was somewhat dull, and the insects could be pill-boxed easily as they rested on the stems of the grasses. On May 29th *Argynnis euphrosyne* was about on Ranmore Common, but was somewhat wild and difficult of capture. On several occasions during the month I have come across broods of fifty or sixty larvæ of *Vanessa urticæ*, and some that I took began to pupate to-day. —F. A. OLDAKER; Parsonage House, Dorking. June 4th, 1901.

COLLECTING LEPIDOPTERA IN TANGIER.—The following is an account of four months' collecting in Tangier, from Jan. 1st till April 27th, 1900. The whole of January was brilliantly fine except for occasional gales of wind, and so my father and I could go out regularly. The insects out during January were *Pararge egeria* (a very red form), *Gonepteryx cleopatra* (hybernated), *Euchloë belemia*, *Vanessa cardui*, very fine and dark specimens, *Colias edusa* for the first fortnight of the month, and one *P. machaon* on the 19th, which seems very early. *Pieris brassicæ*, *P. rapæ*, and *P. napi* were all out in abundance, *P. napi* being the scarcest. *P. brassicæ* is very different to our English one, being half as big again; there were several pupæ of it on an outhouse. We also found several lappet-like larvæ feeding on two sorts of *Genista*, but they hatched into an egg, with great difference in the sexes; also a larva of *Acherontia atropos*, which died. *Macroglossa stellatarum* was common always, and *M. bombyciformis* was in fair numbers at the end of the month. *Vanessa atalanta* was common during February. I might perhaps describe the two places we caught most of our insects in. One was the end of our own garden, but it was a regular tangle of valerian, hawthorn, gladiolus, and other flowers, and had a ravine in it, with a stream at the bottom. Here we got every species we collected, except *Thestor ballus* and two sorts of *Cænonympha*, which were only obtained in open moorland country. The other place was a disused gravel-pit, overgrown with geranium and bordered by evergreens. "Blues" began to appear about the middle of February, *Lycæna argiolus* being common; but the weather at the end of February and the beginning of March was nearly always wet. On February 27th we caught our first *Thais rumina*, and continued to catch this species till the end of March, when it suddenly disappeared and gave no sign of being over, as the specimens we took were perfect to the end, and we hardly ever saw any rubbed or worn examples. On March 5th we saw some beautiful *Papilio podalirius* in a friend's garden, but they flew so high we could not catch them. The next day we caught a male *Euchloë eupheno*; all the males of this species come out much earlier than the females. The first example of the latter that we obtained was on April 1st. The under side of the hind wings is mottled with green, not marked with lines as in the European variety *euphenoides*. We also saw *Thestor ballus* on March 6th; *Gonepteryx rhamni*, too, was on the wing by this time. *E. belemia* was still out in

abundance, though there were "lulls" in its appearance. We caught *P. podalirius* on March 19th, and again on the 21st, when we also got *Polyommatus phlæas* and *Cænonympha pamphilus*. On March 23rd we got *Thecla rubi*—the specimens were in splendid condition—and also obtained *Hemerophila abruptaria*, *Phlogophora meticulosa*, and *Agrotis exclamatoris* in the evening. On March 29th we got *Thestor mauritanica*. This species was extremely local, being found in a few square yards only. On April 4th my father rode to a lake about sixteen miles from our house and collected around it; he went to a place in which he had caught *Thestor ballus* eight years previously; the wind was blowing hard, but he managed to catch twelve specimens in fair condition. The next day we got *Lycena bætica*, and a very dark olive female example of *Thais rumina*. On March 22nd we saw the females of *Gonepteryx cleopatra* depositing eggs on an evergreen shrub near the gravel-pit mentioned above; we took the eggs as she laid them, and brought them home; we also found two newly hatched larvæ two or three days later. The first larva hatched out on April 1st, and was in pupa by April 21st, and a fine male emerged on May 10th. The others did about the same. The caterpillar is grass-green, with a pale line down each side, and never changes much in colour from egg to full-grown. On April 8th my father saw a hybernated *Charaxes jasius* which is found here, but the fresh ones come out in August; it feeds on the arbutus. On April 13th we all went out to the "pig-sticking" camp, and took our nets and other appliances, but there was not much time for butterflying. The lamps at night attracted *Pseudophia tirrhæa*, *Arctia villica*, and a huge red eggar female in numbers; also *Agrotis saucia*; we caught *Catophia alehymista* also.

I have now returned to England, having left Tangier on April 27th, and have heard from my father that he has caught *Chærocampa celerio* and *Saturni pyri*, some eggs of which I now have. It was really too early in the year for the majority of insects, but, nevertheless, it was very enjoyable collecting, and one could get excellent specimens of every sort. I found a lot of larvæ, which were very gregarious at first, but spread out when they grew older; they were black when small, and bright yellow hairs with long white hairs when full-fed. They have all pupated, but no imagines have yet emerged. I forgot to mention three varieties of the lappet-like larva—bright chestnut, dull brown, and grey, as in *quercifolia*.—G. MEADE-WALDO; care of P. Williams, Esq., Eton College, Windsor.

COLIAS HYALE AND VARIETIES OF SYRICHTHUS MALVÆ AND MELITÆA CINXIA IN THE ISLE OF WIGHT.—Among my captures of Diurni in the Isle of Wight, during Whit-week, were a perfect specimen of *Colias hyale*, one of *Syrichthus malvæ* (*alveolus*) var. *taras*, and a striking variety (a male) of *Melitæa cinxia*.—R. S. MITFORD; 35, Redcliffe Square, South Kensington, June 20th, 1901.

LEPIDOPTERA IN THE NEW FOREST AT WHITSUNTIDE.—Three days' collecting at Lyndhurst, with Mr. A. D. Wilson, of Fife, produced satisfactory results. *Argynnis euphrosyne* and *Gonepteryx rhamni* swarmed all over the forest, while *Thecla rubi* and *Nemeobius lucina* were abundant, the latter in Stubley Copse. As usual, *Macroglossa fuciformis* and *M. bombylififormis* were fairly common near the railway line at Wood Fidley. Among other moths taken were:—*Drepana falcata*, *D. unguicula*, *Lithosia aureola*, *Boarmia consortaria*, *Ligdia adustata*, *Macraria liturata*, *Thyatira batis*, *Dicranura vinula*, *Euclidia mi*, *Odontopera bidentata*, *Arctia mendica*,

Orgyia pudibunda, *Notodonta camelina*, *Hylophila prasinana*, *Tephrosia crepuscularia*, and *Eurymene dolobraria*. We spent most of the time in beating and searching for larvæ, and, although we were unfortunate this year in not securing a single larva of *Apatura iris*, we obtained, however, a great many larvæ, including *Thecla quercus*, *Catocala sponsa*, *C. promissa*, *Taniocampa miniosa*, *Cymatophora ridens*, *Bombyx neustria*, *Dicranura vinula*, *Liparis monacha*, *Amphidasys prodromaria*, *Cleora glabraria*, *C. lichenaria*, *Pacilocampa populi*, *Hylophila bicolorana* (four), *Triphæna fimbria*, *Noctua brunnea*, *Agriopsis aprilina*, *Nyssia hispidaria*, *Geometra papilionaria*, *Limenitis sibylla*, and a nest of very small *Vanessa polychloros*.—H. O. WELLS; Hurstfield, The Avenue, Gipsy Hill, London, June 10th, 1901.

NOTE ON *MACROGLOSSA FUCIFORMIS* AND *M. STELLATARUM*.—I believe that *M. fuciformis* is generally looked upon as somewhat rare in this neighbourhood. On June 8th and 9th I saw the species in some abundance on the side of the road in Worth Forest, hovering over *Ajuga reptans* (bugle); the moths were very easy to catch. To-night, June 22nd, at 8.20 p.m., *M. stellatarum* visited our garden. Is not this rather a late hour? Would any of your readers be kind enough to tell me of any locality in Surrey or Sussex where I might obtain one or two *Melitæa athalia*?—HERBERT BEADNELL; Fernside, Redhill, Surrey, June 26th, 1901.

COLIAS HYALE IN JUNE.—I took a specimen of *C. hyale* at Wicken on June 22nd last, evidently newly emerged, as it was beautifully fresh, although one hind wing was broken, probably by the gale that was blowing at the time.—H. W. SIMMONDS; 66, Sydney Street, Chelsea, S.W., June 26th, 1901.

On June 14th last I took a perfectly fresh specimen of *Colias hyale* near here. From its appearance I am satisfied that it could not have hibernated as a butterfly. It is worthy of notice that I have now taken *C. hyale* in this neighbourhood three years in succession. I took four specimens in 1899; last season they were very common, and now this specimen. I have never before taken it earlier than August.—H. HUGGINS, JUN.; 13, Clarence Place, Gravesend, June 25th, 1901.

LARVÆ AND PUPE OF *PLUSIA MONETA* IN KENT.—On June 5th I had an opportunity of spending an afternoon in the beautiful garden of my mother's home at Bidborough, near Tunbridge Wells. While admiring the luxuriance of a particularly fine herbaceous border, I was struck by the unusual appearance of one of the leaves on a plant of *Delphinium*, and a closer scrutiny was rewarded by the discovery of a nearly full-grown larva of *Plusia moneta*. Further search revealed three more larvæ, and no less than twenty-four cocoons of a rich golden silk, which were attached to the under surface of the leaves. During the last few years that I have lived at Bidborough, I have always searched the same plants indefatigably, but in vain; so that it is the more curious that I should have been successful on the occasion of a flying visit like the present.—H. W. SHEPHEARD-WALWYN; Dalwhinnie, Purley, Surrey.

PLUSIA MONETA IN SUSSEX.—While out nothing about nine o'clock in the evening on Wednesday, June 27th, I caught a specimen of *P. moneta* on a syringa-bush.—(Miss) GLADYS TEDDEN-FISHER; Apsleytown, East Grinstead, Sussex.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—*June 5th, 1901.*—The Rev. Canon W. W. Fowler, M.A., President, in the chair.—Mr. G. C. Champion exhibited a male specimen of *Odontæus mobilicornis*, one of the rarest of British beetles, captured at Woking on May 28th. Mr. Donisthorpe said that the same species had also been taken this year at Bournemouth by Mr. and Mrs. Jackson.—Mr. R. McLachlan exhibited four specimens of a curious bug of the genus *Henicocephalus*, received from Mr. G. V. Hudson, of Wellington, New Zealand; he thought the genus, although of very wide distribution, had not previously been noticed in that country. Mr. Champion said that *Henicocephalus* was generally recognized as a type in itself of a family, and Mr. Kirkaldy that it was much commoner than generally supposed. It was probably only an aberrant form of the Reduviidæ having no stridulating apparatus on the prosternum.—Mr. C. P. Pickett exhibited a series of *Smerinthus tiliæ*, bred during May, 1900 and 1901, including one male specimen having the right upper wing banded, the left wing with the two ordinary spots; a banded female; a male with only one spot; and a richly coloured female.—Mr. C. G. Barrett exhibited imagines, cocoons, pupa-skins, and also water-colour sketches of larvæ, reared and drawn by Miss Frances Barrett, at Buntingville, Pondoland, South Africa, including *Hesperia keitloa*, *Leucaloea eugraphica*, *Liparis pulvereæ*, *Lenodora montana*, *Trabele ochroleuca*, *Chilena prompta*, *Braura ligniclua*, *Eutricha pithyocampa*, *Dulichia fasciata*, *Porela sobria*, *Rhanidophora phedonia*, *Sphingomorpha chloreæ* (*monteironis*).—Dr. A. Jefferis Turner exhibited specimens of Australian wood-boring Lepidoptera belonging to four different families. They included—Pyralidæ: *Doddiana xyloryctis*, Turn. Gelechiidæ: *Cryptophasa flavolineata* and *C. hemipsila*, Turn., *Maroga mythica*, Meyr., *M. setiotricha*, Meyr., *Uzucha borealis*, Turn. Cossidæ: *Dudgeona actinias*, Turn., *Xyleutes pulchra*, Roths., *X. macleayi*, *X. nephocosma*, Turn. Hepialidæ: *Charagia mirabilis*, Roths., *C. ramsayi*, Scott, and *C. cyanochlora*, Lower.—Mr. H. Goss exhibited, for Mr. Ernest Ardron, of Colombo, Ceylon, two specimens of a species of *Phyllium* (Phasmidæ). They bore an extraordinary resemblance to leaves. He also showed three varieties of the male of *Melitæa cinxia*, which he had taken on May 27th and 28th at Niton, Isle of Wight.—Mr. C. O. Waterhouse exhibited two new genera and species of Coleoptera, recently described by him in the Ann. and Mag. Nat. Hist., from Rio Janeiro. One belonged to the aberrant Prisnidæ (*Pathocerus wagneri*); the other (*Tetraphalerus wagneri*) belonged to the Cupesidæ, and was remarkable for the form of its head. He also exhibited male and female of the curious Scarabæid, *Glyphoderes sterquilinus*, West., from North Argentina.—Mr. H. St. J. Donisthorpe exhibited a glove burnt by discharges of formic acid in the nests of *Formica rufa*. In connection with the apparatus exhibited at the last meeting to determine the strength of this acid, Professor Poulton said that the discharges collected in the tubes fluctuated greatly in strength, the strongest yielding a proportion of sixty to seventy per cent. of anhydrous acid, a drop of which placed by Mr. Holroyd on the back

of his hand left a distinct scar some days after the application. The discharge of *Dicranura vinula* showed a strength of about forty-five per cent.; and Mr. F. Merrifield remarked that in breeding the larvæ of that species the acid liberated by them left a yellow stain on the leno, making it rotten.—Mr. W. Schaus communicated "A Revision of the American Notodontidæ," and Mr. H. St. J. Donisthorpe read a paper on "Cases of Protective Resemblance, Mimicry, &c., in British Coleoptera."—H. ROWLAND-BROWN, *Hon. Sec.*

SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—*April 25th, 1901.*—Mr. H. S. Fremlin, F.E.S., President, in the chair.—The evening was devoted to a special lecture by Mr. R. Kearton on "Wild Life in Nature," illustrated by a large number of original lantern-slides.

May 9th.—The President in the chair.—Mr. Step exhibited a number of living specimens of the fungus-inhabiting coleopteron, *Mycetophagus quadripustulatus*, from the banks of the Brent.—Mr. Kemp, between seventy and eighty cases made by larvæ of caddis-flies (Trichoptera) of the genera *Phryganea*, *Limnophilus*, *Sericosoma*, *Anabolia*, and *Molanna*, from the neighbourhood of London and Oxford; numbers of examples were composed wholly or partly of fresh-water shells.—Mr. Enoch, living nymphs of *Anax imperator*, *Æschna cyanea*, *Brachytron pratense*, *Calopteryx splendens*, and *Erythromma najas*, from the Black Pond, Esher, and Byfleet.—Mr. Edwards, a species of trap-door spider from Jamaica, together with its nest; a large species of dragonfly from Bogota; and a specimen of the lantern-fly, *Fulgaria latenaria*.—Mr. Lucas, specimens of the so-called fresh-water limpet, *Ancylus lacustris*, from the canal near Byfleet.—Mr. Clark, photographs of the ova of *Tæniocampa stabilis* and *Ennomos tiliaria*.—Mr. Turner, a living nymph of *Anax imperator*.—Dr. Chapman, living specimens of *Thais polyxena*, bred from larvæ taken in the South of France.—Mr. Fremlin, several cultures of bacteria obtained from the dead pupæ exhibited by Mr. Adkin several meetings ago. A discussion ensued.—Mr. W. Bateson, F.R.S., gave an address on "Recent Advances in the Study of Heredity," and exhibited numerous specimens in illustration.

May 23rd.—Mr. W. J. Lucas, B.A., Vice-President, in the chair.—Mr. Robert Adkin, living examples of the coleopteron, *Pyrophorus noctilucus*, from Jamaica, and contributed notes.—Mr. F. M. B. Carr, a large number of species of Lepidoptera taken or bred this year, mainly from the New Forest, including *Drymonia chaonia*, *Anticlea nigrofasciata*, *Cidaria psittacata*, *Asphalia flavicornis*, *H. ridens*, &c.—Mr. Step exhibited a considerable number of lantern-slides illustrative of his address on "Spring Notes." Some were from photographs taken at Oxshott during the Society's Field Meeting.—HY. J. TURNER, *Hon. Rep. Sec.*

RECENT LITERATURE.

Economic.—L. O. HOWARD describes "The Principal Insects affecting the Tobacco Plant" (Farmers' Bull. 120, U. S. Dept. Agriculture, 1900, pp. 1-32, 25 text figures); and J. B. SMITH discusses "The Role of Insects in the Forest" (1900, Ann. Rep. State Geol. New Jersey for 1899, pp. 205-32, 9 figures).

Economic.—*The Proceedings of the 12th Annual Meeting of the Association of Economic Entomologists* (held in New York City last June) contain, as usual, a number of reports and notices of general interest.

C. M. WEED describes the oviposition of an egg-parasite of *Eucanessa antiopa*. "*Antiopa* was seen ovipositing on *Salix*. After laying about twenty eggs she flew away. The moment she left a small hymenopterous—*Telonomus graptæ*, Howard—was seen running over the eggs. The parasite was watched for the next half-hour, during which time it oviposited in fifteen eggs. Does the parasite ride around on the butterfly, waiting for oviposition?"

A. H. KIRKLAND reports on the Brown-tail Moth (scientific name not given, but presumably *Porthesia chrysorrhæa*) in Massachusetts. The insect was first noted in the State in 1897, but it was possible to ascertain the affected area in 1896, and this was computed at 29 square miles; in 1897 this had increased to 158 square miles, to 448 in 1898, and to 928 in 1899! It has now passed the borders of Massachusetts into New Hampshire and Maine (1900, Proc. 12th Ann. Meeting Assoc. Economic Entom.—U. S. Dept. Agriculture. Division Entom. (n. s.), Bull. 26, pp. 1-102, 2 plates and 1 text figure).

G. W. K.

Economic.—E. DAGUIN. *Les Insectes Comestibles dans l'antiquité et de nos jours* (Paris, 1900, pp. 1-29).

This interesting but somewhat fantastic brochure is a reprint, in different form, from the series of articles running some little while ago in 'Le Naturaliste.' Commencing with a discussion on the propriety of the word "insecte" being applied to a crustacean or a spider, the author proceeds to dilate on the gustible properties of the latter. We have already (1900, p. 87) cited the passage in which the celebrated Lalande's passion for the succulent Arachnid was described; Labillardière tells us that *Epeira novæ-hollandiæ*, Walck., is devoured by the aborigines of Australia. We ourselves have experimented in this way on caterpillars, waterbugs, locusts, and aphides, but have not yet extended our researches to spiders. Krachenninikov asserts that the women of Kamtskatka, who desire to be blest with children, eat spiders. The culinary properties of various coleopterous, lepidopterous larvæ, of locusts, and so forth, are discussed at some length. With regard to locusts, the reviewer has eaten them; it may possibly have been the fault of the method of the preparation, but to his mind they cannot be

referred to as table delicacies, for they resemble in taste shrimps dipped in train-oil, and powdered with coal-dust! The author concludes:—"Man can eat insects: nothing in his anatomical organization nor in his physiological functions prevents it. Man ought to eat insects: first, because his cousins the monkeys, and his remote kinsmen the bats, in a word the *primates* [sic!], eat them; second, because insectivorous animals outstrip the other kinds (*espèces*) of their order both by their more perfect organization, and by the excellence of their intelligence"!!

G. W. K.

Die Geradflügler Mitteleuropas von Dr. R. Tümpel. Eisenach, 1901.

STUDENTS of nature owe their gratitude to Dr. Tümpel for adding to the comparatively scanty list of books devoted to orders of insects that have long been much neglected, but which nevertheless are in many ways closely connected with the well-being or otherwise of man, and the success or failure of his undertakings.

Dr. Tümpel's work has been appearing in parts for some time, and now in a complete form we have a quarto volume of some 300 pages treating in a comprehensive manner of the Neuroptera, Orthoptera, and Thysanoptera of Central Europe.

After full introductions to the various subdivisions of the orders treated, we have a short description, &c., of the various species. Of the twenty-three plates, most of them printed in colours, the majority are excellent, the Orthoptera being perhaps on the whole rather better than the Neuroptera, though we think the Corduline and Gomphine dragonflies particularly good. Some of the smaller dragonflies should have been magnified. Plate xii., giving figures of a dozen dragonfly nymphs, is hardly satisfactory—the shape of the abdomen of *Libellula depressa* and the length of the legs of *Cordulia aenea* will make identification difficult; while the nymph named *Agrion puella* should probably be *Erythromma najas*.

W. J. L.

OBITUARY.

It is with regret we have to record the death, on May 13th, 1901, of Monsieur ALEXANDRE CONSTANT, who was well known as a thorough entomologist. He described many new species of Micro-Lepidoptera, but took little interest in the larger species. Monsieur Constant lived in a pretty villa at Golfe Juan, near Cannes, though he usually spent a part of the year in Corsica, or other parts of France. His garden, in which he took a great interest, was planted with many beautiful palms and other plants. He was a member of the Entomological and Botanical Societies of France, and formerly President of the Horticultural Society of Cannes. His death took place suddenly at his Villa Niobé. He was in his seventy-second year, and leaves a widow.

J. C. W.

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INTERMEDIATE FORMS OF *AMPHIDASYS BETULARIA*.

By FRANK LITTLEWOOD.

THE accompanying illustrations represent varieties of *A. betularia* recently bred by myself. On the night of August 15th last year I discovered sixteen almost full-fed larvæ of this species



feeding on a plum-tree in my garden. They were by no means easy to see on account of their exact resemblance to the twigs of the plum, and I wish now that I had given the tree a more thorough search. Knowing it to be a somewhat variable species, I took as many as I could find, and fed them carefully for the

few remaining days of their larval life, when all pupated successfully. In the beginning of December I placed them along with other pupæ to force in a moderate heat—about 70°. The pupæ lay on dry soil, a damp cloth placed over the muslin-covered lid



keeping the air within the box sufficiently moist. The first example to emerge was a male on Jan. 5th, and others continued to come out at intervals until March 1st. This in itself is to me a curious point. When a number of larvæ of the same age pupate together, are put to force together, and are subjected to the same temperature, why should one moth take as much as two months longer to develop than another? Out of sixteen pupæ I bred fourteen (nine males, five females) perfect imagines, and two (one male, one female) whose wings never developed. With the exception of one male, which is as near as possible var. *doubledayaria*, all the specimens are of a distinct intermediate form between type and var. *doubledayaria*. Not one approaches nearly that form generally recognized as the type. Does this point to parents of opposite forms—one type, the other var. *doubledayaria*; or to typical parents, each more than usually dark, and producing still darker descendants?

The fore wings are thickly speckled with black scales, in some parts so closely as to form blotches, especially towards the tip and around the hind margin. Throughout the lighter portions of the wing the nervures show up distinctly black. The hind wings are dark round the hind margin, becoming gradually lighter towards the base. The body is about evenly speckled with black and white, although in two of the specimens it is almost entirely black.

The wide intervals which occurred between the emergences of my specimens made it impossible for me to attempt pairing in captivity; while the early date, occasioned by forcing,

prohibited sembling with the females, and I regret that I was thus unable to breed from my stock. Of the two forms of *A. betularia*, the var. *doubledayaria* occurs in this district by far the most frequently. The earliest record of the capture of *doubledayaria* was about the year 1870.

We are, here, in fine open country, far removed from the smoke of a manufacturing town, consequently the tree trunks preserve their natural variety of colour.

I should mention that the three specimens were photographed natural size, and the other eight reduced about half.

Lynn Garth, Kendal : May 30th, 1901.

AGRION PULCHELLUM, VAR., RESEMBLING *A. PUELLA*.

By W. J. LUCAS, B.A., F.E.S.

NORMALLY in this species the characteristic spot on the dorsal surface of the second segment of the abdomen consists of a U, strongly connected with the black circle posterior to it. Occasionally the connection is weaker, and in a specimen before me, taken at the Byfleet Canal on June 26th last, it is absent (*vide* figure), causing the insect at first sight to resemble a male



Agrion pulchellum, ♂ ab. Dorsal surface of segments 1 and 2, much magnified.

of *Agrion puella* (*cf.* Plate II., *ante*, figs. 1 and 2). That it is not really *puella* may be known by the posterior margin of the prothorax, the divided humeral blue stripes, and the shape of the anal appendages. This form has occasionally been noted before (*vide* De Selys' 'Revue des Odonates,' p. 198, and my 'British Dragonflies,' p. 280), but in places where both species fly together, as at Byfleet Canal, this uncommon variety of the less frequent species might easily be passed over for a typical *puella*.

Kingston-on-Thames.

ON LABELLING INSECTS.

By T. B. FLETCHER, R.N., F.E.S.

MR. BRUNETTI'S article on labelling (*ante*, p. 172) will appeal to every entomologist, whatever his particular speciality. There are of course some who do not label their captures at all, either because "it is too much trouble," or because they think "labels spoil the appearance of the collection"; but the number of these is happily becoming every year small by degrees and beautifully less, and to them my remarks are not addressed. Everyone else will agree that labelling is not only useful, but absolutely essential; but at the same time, as Mr. Brunetti says, there is a great lack of uniformity in the matter, for each has his own particular method. The question then is—what is the best system?

The ideal method would doubtless be to have attached to every specimen its full history, *i.e.* the zoo-geographical region, country, district, and place of capture, the date (day, month, and year), climatic conditions (height above sea-level, temperature, nature of soil, vegetation, &c.), habits, name of collector, &c.; but in practice it will be found that this cannot be carried out. The modified method which I use is as follows:—

I have a book in which all acquisitions are entered under the headings of Number, Name and Sex, Date, Locality, and Remarks. Examples:—

No.	NAME.	DATE.	LOCALITY.	REMARKS.
4050	Bapta temerata	6. June. 00.	Torpoint, Cornwall, England.	Beaten from a hedge. Only one seen.
4098	Callophrys rubi ♀	23. April. 01.	Argostoli, Greece.	Only one seen; very worn.
4129	Ægeria apiformis ♂	27. April. 01.	Nauplia, Greece.	Common on poplar trunks on the road to Tiryns; mostly low down on the trunk. Found about twenty pupae-cases (emerged), almost all very low down on north or east side of the tree.
4195	Cyaniris argiolus ♂	3. June. 01.	Suda Bay, Crete.	Fairly common sporting round plane trees. No females seen or beaten.

Each specimen thus has a distinguishing number, which, with the principal particulars (country, locality, and date), is placed on the label, which is itself attached to the specimen. The labels would then read:—

4050 Anglia. Cornwall. 6. vi. 00. *	4098 Grecia. Argostoli. 23. iv. 01. *	4129 Grecia. Nauplia. 27. iv. 01. *	4195 Creta. Suda. 3. vi. 01. *
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It will be noticed that these labels are longer and narrower than Mr. Brunetti's, so that the most important particulars project well in front of the specimen and are easily read; by turning to the catalogue any further details may be at once seen.

With Mr. Brunetti's remarks on the method of writing the date I am quite in accord; to place the month before the day is like putting the cart before the horse. The use of Roman numerals to further distinguish the month is an excellent scheme, and if collectors cannot bring themselves to do this, they should at least write Jan., Feb., Mch., &c.

The collector's name hardly seems necessary unless there are large acquisitions by exchange or purchase; but a note in the remarks column of the catalogue, or a second label on the insect, would serve the purpose.

I am, of course, aware that there are many other methods. Some only attach catalogue numbers to the specimens, but this entails reference to the catalogue in every case, whereas my method only requires such reference when full details are required. Others place their labels beside their specimens, so as to be clearly seen, and so that one label will do duty for all captures on one occasion; but this is only of advantage when the limits of a collection are well marked out; otherwise it means the constant trouble of shifting the label also whenever a specimen is moved, and if the specimens should get separated from their labels, it seems to me that there might be considerable difficulty in pairing them off again.

In conclusion, without wishing to assert that my method is the best possible, I do say that it answers very well, and possesses the following advantages:—

(1). The labels can easily be read without removing the specimen; thus a great factor in deterioration is absent.

(2). If it does require to be taken out of its box for comparison, exhibition, &c., each specimen is complete in itself, and so there is no danger of its data being lost.

(3.) By means of the catalogue number a large amount of information about habits, &c., may be jotted down at the time when fresh in the memory, and is always ready to hand.

H.M.S. "Gladiator," Mediterranean Station:
10th June, 1901.

ON THE NOMENCLATURE OF THE GENERA OF THE RHYNCHOTA, HETEROPTERA AND AUCHENORRHYNCHOUS HOMOPTERA.

By G. W. KIRKALDY, F.E.S.

(Continued from p. 179.)

? 1834 [1832-5.] WESTWOOD, Zool. Journ. v. 445-7 (a) *Dero-ploa* t. *parva*; *Platydius*⁹² t. *subpurpurascens*; *Opisthoplatys* t. *australasiæ*.

1834. GUERIN, Ins. Voy. Belanger, 441-80 and 497-502. (a) *Eurybrachys* t. *lepeletieri*; *Eumallia*⁹³ t. *variegata*; [Atlas, pl. 3 & 4, fig. 3. (β) *Euryptera*⁹⁴ t. *obscura*]. BURMEISTER, Ent. Rev. ii. 1-26. (a) *Pseudaradus*⁹⁵ t. *brevicornis*; *Merocoris*⁹⁶ t. *merianæ*.⁹⁷ (β) *Asopus*.⁹⁸ HAHN, Wanz. Ins. ii. [Feb.] 33-60. (a) *Tectocoris* t. *cyanipes*; ⁹⁹ *Chrysocoris* t. *stollii*; ¹⁰⁰ *Globocoris*¹⁰¹ t. *globus*¹⁰² *Tropicoris*¹⁰³ t. *rufipes*; *Empicoris* t. *variolosus*; *Ursocoris*,¹⁰⁴ types *dorsalis* + *fuliginosus*.¹⁰⁵ (β) *Ventocoris*, *Bellocoris*.¹⁰⁶ (γ) *Thyreocoris*, 1801, t. *scarabæoides*; ii. [May] 61-80. (β) *Clinocoris*, *Eysarcoris*; ii. [July] 81-100. (a) *Paracoris*¹⁰⁷ t. *paradoxus*. (β) *Cyllecoris*. WESTWOOD, Ann. Soc. Ent. France, iii. 642. (a) *Microphysa* t. *pselaphiformis*. DUFOUR, l. c. 341-57. (a) *Cephalocteus* t. *histeroides*. (δ) *Postemma*, 1832. WESTWOOD, l. c. 637-53. (a) *Microvelia* t. *pygmæa*. HAHN, Wanz. Ins. ii. [Oct.] 101-22. (a) *Acinocoris* t. *calidus*. (β) *Merocoris*,¹⁰⁸ *Arenocoris* [*Cydonus*].¹⁰⁹ BURMEISTER, Meyen's Reise [March 12] Abh. 6; Ins. 285-806 [Act. Ac. Caes Leop. Carol. xvi. Suppl. 403-80]. (a) *Dasyneus*¹¹⁰ t. *coccocinctus*; *Loricerus* t. *hæmatogaster*. (β) *Cerbus*. (δ) *Amaurus* for *Pseudaradus*, 1834, *Ceptocoris* for *Leptocoris*, 1833.

⁹² = *Megymenum*, 1830.

⁹³ Homotyp. *Phenar*, 1833.

⁹⁴ Invalid, not described; also preoccupied.

⁹⁵ = *Megymenum*, 1830.

⁹⁶ Preocc. Perty, 1830-2.

⁹⁷ = *meriani*, Fabr.

⁹⁸ = *Discocera*, 1832, + *Stiretrus*, '32.

⁹⁹ = *lincola*, Fabr., var.

¹⁰⁰ = *stolli*, Wolff.

¹⁰¹ Homotyp. *Coptosoma*, 1832.

¹⁰² = *scutellatus*, Fourer.

¹⁰³ Homotyp. *Pentatoma*, 1789.

¹⁰⁴ Homotyp. *Odontoscelis*, 1832.

¹⁰⁵ Both are vars. of one species.

¹⁰⁶ *Odontotarsus* + *Eurygaster*, 1832.

¹⁰⁷ = *Pendulinus*, 1822.

¹⁰⁸ Preocc. Perty, 1830-2, and Burm. 1834.

¹⁰⁹ Not described.

¹¹⁰ = *Pendulinus*, 1822.

1835. LEWIS, Trans. Ent. Soc. Lond. i. 47-52. (a) *Idiocerus* t. *stigmatalis*; ¹¹¹ *Batrachomorplus* ¹¹² t. *irroratus*. ¹¹³ (β) *Macropsis*. (γ) *Bythoscopus*, 1833, t. *lanio*. BOISDUVAL, Voy. Astrolabe, Zool. pt. ii. Coleopt. &c., 60946. (a) *Brachyplatys* t. *vanikorensis*. (β) *Astacops*. (δ) *Alidus*, 1803; *Næmatopus*, 1825. H.-SCHAFER, Nomencl. Ent. 35-116. (a) *Dicranomerus* ¹¹⁴ t. *nugax*. HAHN, Wanz. Ins. [Aug.] iii. 1-16. (a) *Stenogaster* t. *tardus*. ¹¹⁵ GERMAR, Rev. Ent. iii. 223-61. (a) *Hypsauchenia* t. *ballista*. (δ) *Entilia*, 1833; *Heteronota*, 1832; l. c. 307-11. (a) *Lycoderes* t. *ancora*. BURMEISTER, Handb. ii. 99-396. (a) ^{115a} *Dorydium* t. *paradoxum* ^{115b}; *Machærota* t. *ensifera*; *Umbonia* t. *spinosa*; *Polyglypta* t. *costata*; *Cyphotes* t. *nodosa*; *Hynnys* t. *rosea*; ¹¹⁶ *Pterodictya* t. *ephemera*; *Bothriocera* t. *tinealis*; *Hemidictya* t. *frondosa*; *Notocyrtus* ¹¹⁷ t. *clavipes*; *Tiarodes* ¹¹⁸ t. *versicolor*; *Oncocerphalus* t. *squalidus*; *Labops* t. *diopsis*; ¹¹⁹ *Harmostes* t. *dorsalis*; *Actorus* ¹²⁰ t. *fossularum*; *Chlænocoris* t. *impressus*; *Cyrtocoris* t. *lundii*. (β) *Colpoptera*; *Myocoris*; *Euagoras*; *Spiniger*; *Holotrichius*; *Pseudophlæus*; *Discogaster*; *Homæocerus*; *Colobathristes*; *Hypselopus*; *Paryphes*; *Physomerus*; *Dinocoris*; *Sphærocoris*; *Pachycoris*; *Augocoris*; *Archimerus* for *Pachymeria*, 1832; *Largus* ¹²¹. (γ) *Cælidia*, 1821, t. *venosa*; *Stegaspis*, 1833, t. *fronditia*; *Otiocerus*, 1819, t. *stollii*; *Cerbus*, 1834, t. *umbilicatus*; *Acocephalus* [recte *Acucephalus*], 1833, t. *striatus*; *Ptyelus*, 1825, t. *ferrumequinum*; ¹²² *Spartocera*, 1832, t. *geniculata*; *Cymus*, 1832, t. *claviculus*. (δ) *Euacanthus*, 1825; *Aethalia*, 1810; *Cixia*, 1804; *Caloscelis*, 1833; *Pseudophana* for *Dictyophora*; *Pæocera*, 1832; *Aphana*, 1830; *Belostomum*, 1807; *Hydroessa* for *Microvelia*, 1833; *Limnobates* for *Hydrometra*, 1796; *Macrops* ¹²³ for *Macrophthalmus*; *Hammato-cerus* for *Hammacerus*, 1832; *Ectrychotes* for *Ectrichodia*, 1825; *Phyllomorphus*, 1832; *Pirates*, 1831; *Crinocerus* for *Acanthocerus*, 1805; *Phyllocephala*, 1832; *Meropachys*, 1832; *Cephalocterus* for *Cephalocteus*, 1834; *Oncomerus*, 1832; *Megalymenum*, 1830; *Phlæocoris* for *Phlæa*, 1825; *Peltophora* for *Scutiphora*, 1830; *Atelocerus*, 1832; *Callidea*, 1832; *Spartocerus*, 1832; *Tessera-toma*, 1825.

¹¹¹ = *adustus*, H.-S.

¹¹² = *Bythoscopus*, 1833.

¹¹³ = *microcephala*, H.-S.

¹¹⁴ Homotyp. *Stenocephale*, 1825.

¹¹⁵ = *lavatera*, F.

^{115a} Homot. *Cephalelus*, 1832.

^{115b} = *infumatus*, Perch.

¹¹⁶ = *degeeri*, Kirby.

¹¹⁷ Attributed to Hoffmannsegg;
vide 1817.

¹¹⁸ Homotyp. *Cimbus*, 1832.

¹¹⁹ = *sahlbergii*, Fall.

¹²⁰ Homotyp. *Microelytra*, 1832.

¹²¹ = *Euryophthalmus*, 1832.

¹²² = *flavescens*, Fabr., var. *olivacea*,
Fabr.

¹²³ Preocc. Perty, 1830.

NOTES ON LEPIDOPTERA FROM THE MEDITERRANEAN.

BY T. B. FLETCHER, R.N., F.E.S.

SOME little time ago Messrs. G. F. Mathew and P. de la Garde published in the 'Entomologist' (xxxi. 77 *et seq.*, and xxxii. 8) a list of Lepidoptera captured on the Mediterranean Station, which proved so interesting to me that I have been led to hope that a list of my own captures out here may prove as interesting to others, more especially as of late years there seems to have been a considerable increase in the study of extra-British species. The present paper covers the worst portion of the year, so there are few captures noted; but I intend, if the Editor will allow space, to continue to record the species met with from time to time.

We left England on October 18th, and arrived at Gibraltar on the 23rd, coaling the same day, and leaving early next morning. I did not land, but a specimen of *Agrotis segetum* came on board to light in the evening.

We arrived at Nauplia, in Greece, on the 28th, and stayed there ten days. On November 1st I went ashore and walked out to Argos; it was a blazing hot afternoon, and a long and dusty road. Everything seemed burnt up after the summer heats, but there were several butterflies about, including *Danais chrysippus*, *Pyrameis cardui* and *atalanta*, *Eurymus (Colias) edusa*, *Pieris brassicæ*, and several little "blues" and *Cœnonymphas*. A *Macroglossa stellatarum*, also, which had been rash enough to fly on board, was caught and brought to me. On November 6th we left for Malta, arriving next day, and stayed till the 17th, when we left again for a cruise in the Levant. On the 19th, when off Crete, another *M. stellatarum* came on board; we were a good twenty-five miles distant from land, but this seems a species with a strong predilection for wandering, and great powers of long and sustained flight.

On November 21st we arrived at Limasol, in Cyprus, and next day I landed with a net to see what was to be found on the wing. It was rough walking, there being practically no path, and the fields full of dead and burnt-up thistles and other plants even more prickly; these composed practically all the undergrowth, though there were numbers of scattered ilex trees. Further up, on the hills, there was more vegetation, a little grass and heath and clumps of bushes. Doubtless the country is green in the spring, but now everything was withered and scorched by the summer sun, and all the fields were bare, as the crops had been gathered in. Under these circumstances, butterflies were chiefly conspicuous by their absence, the only specimens seen being one *Pieris* and a few *Pyrameis cardui*—not a single moth or larva.

We left Limasol on the 23rd, and visited Larnaka, Beyrout,

and Alexandretta, but I saw no butterflies at any of these places. On December 1st we arrived at Ayas Bay, a large and shallow bay in the elbow of Asia Minor, opposite Alexandretta. Here *M. stellatarum* was again common about the ship. On the 4th I went ashore, but there were few butterflies, as the nights were now getting cold; the only species I saw were *P. cardui*, *E. edusa* (one), and a few little moths.

On December 8th we left for Alexandretta again, and then went on to Mersina, Smyrna, Deuthero, Salamis, and Suda Bay, arriving at Malta again on January 18th. During this time the weather was far too cold for insects; indeed, when we were at Deuthero, in Roumelia, the thermometer was hovering round the freezing-point the whole time, in spite of our being in the sunny Mediterranean.

On January 20th I walked out to Birzebbugia, at the south-eastern corner of Malta. It was a beautifully bright warm day, which had brought out all the lizards from their holes in the stone walls, but there seemed to be no Lepidoptera on the wing, except a few worn *Pyrameis cardui* and one *Nomophila noctuella*, though from the quantity of flowers about I should have expected more.

On January 26th we left Malta again for Plataea, in Greece, arriving there next day. This is a small harbour, with hills almost all round; these hills are covered with thick bushes and small trees, but the going is very rough indeed, as great jagged blocks of stone are scattered about everywhere. On January 30th I took *M. stellatarum* and *Orneodes hexadactyla*. February 2nd was a gloriously fine day, and I went off with a shooting-party out beyond the lakes, which are some four miles off. Almost at the first start-off I took a nice *Pararge egeria* var. *egerides* (the British, and not the South-European form), and along the path a couple of newly disclosed *Eurymus* (*Colias*) *edusa*; there were several *Pyrameis cardui* about, and *P. atalanta* was quite common, especially near the lakes; the *cardui* were mostly worn, but the *atalanta* quite fresh. On February 7th I saw a fine *Colias* (*Gonepteryx*) *cleopatra* in addition to the foregoing species, but after this we had a spell of dull, wet, and windy weather, which seemed to put everything back, for I saw nothing new.

On February 18th we left for Zea, a little island about fifty miles south-east of Athens. It is very steep and rocky, and rather bare, and there is little undergrowth, but some almond trees, which were now in bloom, attracted the few butterflies about—principally *P. atalanta*. *M. stellatarum* was very abundant, and I spent a long time one afternoon trying to “kodak” a specimen feeding on the wing; by the way, very little seems to have been done in this direction—i. e. the photographic portrayal of insects in their natural environment—though, of course, the subject is a difficult one.

From Zea we went to Volo, and then immediately returned to Malta, arriving on the 26th. *Pieris brassicæ* was now out, and, of course, *Pyrameis cardui* and *atalanta*, with the ubiquitous *M. stellatarum*. During March *Plusia gamma* was plentiful round the electric lamps ashore, and larvæ of *Lasiocampa trifolii* and *Calocampa exoleta* were common. On March 22nd *Pararge megæra*, *Cœnonympha pamphilus*, and *Eurymus edusa* (newly emerged) were common. *P. brassicæ* was abundant, but worn, and *P. rapæ* just emerging, whilst I took one specimen of *Pontia daplidice*. At the end of March, also, *Phragmatobia fuliginosa* emerged from a cocoon found at Citta Vecchia. On April 5th the first *Polyommatus icarus*, with *Anaitis plagiata* and *Metoptria monogramma*, appeared on the wing, and on the 12th I saw the first *Chrysophanus phlæas*.

On April 18th we left Malta for Corfu, arriving there next day. On the 20th I landed with the net for a walk; everything seemed beautifully green after Malta, and there were quantities of flowers everywhere. The roads here are very good, being a relic of the British occupation, and are generally enclosed by a cactus hedge. Away from the town the trees are chiefly olive, which are not good for insects, but around the town there are many clumps of trees and bushes. Owing to the wind, butterflies were chiefly to be found in sunny sheltered corners.

Pyrameis atalanta.—One only. *P. cardui*.—In the most profuse abundance. There must have been thousands; frequently five or six were on the wing around me at once.

Nomiades cyllarus.—Two males only.

Plebeius baton.—One male only.

Polyommatus icarus.—One male of the ab. *icarinus*, Scriba.

Chrysophanus phlæas.—One only; blue-spotted form.

Leptidlia sinapis.—One; very worn.

Pieris rapæ.—Not very common. *P. brassicæ*.—Abundant.

Eurymus (Colias) edusa.—Not very common; in the vineyards.

Plusia gamma.—One.

On the 22nd we left again for Argostoli, in Kephallenia, where "the sea runs into the land."

Pyrameis cardui.—Abundant, but in nothing like such abundance as at Corfu.

Satyrus mæra.—One female; very worn.

Callophrys rubi.—One female; very worn.

Nomiades cyllarus.—Two males.

Plebeius baton.—Fairly common.

Euchlœ belia.—Fairly common, especially in meadows.

Hesperia malvæ.—Common.

Acontia luctuosa.—One.

Aspilates ochrearia.—Common.

Psyche unicolor (graminella).—Cases common. I found a male resting on a case from which a female emerged next day.

We left Argostoli on the evening of April 23rd, and did a couple of days at manœuvres, finally arriving at Nauplia. On the 27th I landed and walked out to Tiryns, where there are some very ancient ruins of immense size, and said to be pre-Hellenic. Here I found:—

Hipparchia semele.—One male; typical.

Cænonympha pamphilus.—Common and typical.

Vanessa egea.—One.

Pyrameis cardui.—Common.

Polyommatus icarus.—One male.

Eurymus edusa and *Pieris rapæ*.—Common.

Euchloë belia.—Common, and in very good condition. Easily distinguishable from *P. rapæ* on the wing, as it looks darker and the flight is swifter.

Achirus machaon.—One rather tattered specimen.

Spilothyrus altheæ and *Pamphila thaumas*.—One of each on the ruins at Tiryns.

Acontia luctuosa.—Common.

Ægeria apiformis.—Common on poplar trunks on the road to Tiryns. I found about a score of empty pupa-cases sticking out of the trees, all low down on the north and east sides. A couple of females I took oviposited freely; the ova are not attached in any way, and in nature are probably dropped promiscuously into the crevices of the bark.

On April 29th we left Nauplia for the Gulf of Patras for another series of manœuvres, and then back to Malta. On May 1st, when about one hundred miles from Greece, a couple of *Deilephila livornica* were caught on board and brought to me; of course, they may have flown on board the night before, though we had all lights out, but it is quite possible that they may have been migrating.

(To be continued.)

SOUTH AFRICAN COCCIDÆ.

By T. D. A. COCKERELL.

THE Coccidæ here discussed form part of a collection sent to me by Mr. Claude Fuller, Government Entomologist of Natal. I had not meant to make any further study of African Coccidæ, except for purposes of comparison with American species, but I have not been able to resist investigating the interesting material sent unsolicited by Mr. Fuller, who, unfortunately, cannot find time to study it himself.

(1). *Monophlebus fulleri*, n. sp.—Maritzburg, Natal, on grass heads; uncommon.

♀. Length 7, breadth 3, height $2\frac{1}{2}$ millim., without cottony covering, but secreting some loose white cotton beneath at maturity;

conspicuously hairy, with long pale ferruginous bristles; salmon-pink when alive (Fuller), when dry very dark greyish (red by transmitted light), with three longitudinal keels covered with granular yellowish white secretion; the thickened margins and the under side also covered with white secretion, which is in large granules, presenting a peculiar appearance.

Boiled in liquor potassæ, turns it yellow; the three "cicatrices" described in *Walkeriana* are present, all elongated; eyes conical, very large and dark, placed immediately below and contiguous to the antennæ; mouth-parts small; body very densely covered with short hairs, together with short and long blunt hairs; long ordinary hairs interspersed along the lateral margins; femur and trochanter $850\ \mu$ long, tibia 120, tarsus (without claw) 460; tarsal digitules represented by a pair of bristles; inner side of tarsus and tibia with a row of remarkable hyaline spear-head-shaped spines, the same also taking the place of the claw digitules; tarsus curved, with a constriction on the upper edge which gives it the appearance of being two-jointed; antennæ apparently 10-jointed (club broken off in the example studied), joint 1 broader than long; 2 and 3 cylindrical, longer than broad; 4 and 5 short cup-shaped; 6 and 7 long cup-shaped; 8 and 9 fusiform; measurements of joints in μ :—(1) 90; (2) 120, and about 100 broad; (3) 114; (4) 80; (5) 80; (6) 80; (7) 90; (8) 100; (9) 100; (10) ?.

Penultimate stage.—Antennæ 8-jointed; 2 and 3 cylindrical as in the adult; last joint long and narrow, $165\ \mu$ long; body hairy like adult.

A distinct species, peculiar for the spear-head-like spines on the legs. Among the American species its nearest ally is *M. primitivus*.

(2). *Monophlebus fortis*, n. sp.—Richmond, Natal, under bark of *Eucalyptus*; only one found.

♀. Dark grey, distinctly segmented, mealy, posterior end covered with cottony secretion; sides with scattered long pale bristles; legs black. Length $5\frac{1}{2}$, breadth $2\frac{1}{2}$ millim.

Boiled in liquor potassæ, does not stain it. Hairy skin just as in *M. fulleri*, also legs, with the same spear-shaped processes, which are even better developed on the tibia. "Cicatrices" as in *fulleri*. Length of tibia about $1100\ \mu$, tarsus (without claw) about 580. Antennæ 11-jointed; measurements in μ :—(1) 150; (2) 150; (3) 150; (4) 110; (5) 110; (6) 110; (7) 110; (8) 130; (9) 120; (10) 120; (11) 160.

Very close to the last, but smaller, though certainly adult, and without the longitudinal white keels.

(3). *Dactylopius filamentosus*, Ckll., small variety.—On leaves of grass, Tongaat, Natal.

Antennal formula 732 (146) 5; joints in μ :—(1) 30; (2) 33; (3) 36; (4) 30; (5) 24; (6) 30; (7) 66. Tibia $90\ \mu$, tarsus 60.

Tinsley has reported this species from Richmond, Natal.

(4). *Pollinia ovoides*, n. sp.—Durban; gregarious on the branches of some tree.

♀. Scale a rounded conical object much like a lepidopterous egg, about $1\frac{1}{2}$ millim. diam., roughened radiately, pale brown with four longitudinal stripes of white secretion converging to the top of the scale, which is usually reddish.

♂. Scale elongated, about $\frac{3}{4}$ millim. long, roughened, yellowish or pink, with an oblique terminal cap.

♀. Scales soaked in liquor potassæ, give a deep orange-brown colour, and the insects themselves turn deep crimson; ♀ adult globose; skin with many simple round glands and tubular glands, and some figure-of-8 glands; anal ring with numerous hairs; caudal lobes prominent, conical, about $45\ \mu$ long, with a few small spines, and ending in stout bristles about $90\ \mu$ long; mouth-parts well developed, but small; labium short and broad, dimerous, the last joint with bristles on its margin; antennæ represented by small rounded tubercles about $15\ \mu$ long, with a little terminal prominence which appears to represent a second joint, and about six stout bristles about $18\ \mu$ long; spiracles small but distinct; legs wanting.

Embryonic larva with a row of figure-of-8 glands down each side, and dorsal and subdorsal rows of small round glands, the latter failing caudad, the last five glands of the dorsal rows being absent in the subdorsal; labium very short and broad, cup-shaped; form of insect elongate-pyriform; antennæ thick, 6-jointed, last joint not very greatly longer than the one before, and notched as in *P. pollini*.

A very distinct species.

(5). *Diaspis crawii*, Ckll., var. *fulleri*, n. var.—On twigs of *Melia azedarach* (called "syringa" in Natal), Maritzburg, Natal.

♀. Scale white, circular, 3 millim. diam., as in *crawii*, but exuviae conspicuous, pale ochreous to dark brown.

♀. Agreeing with *crawii* in the lobes, circumgenital and other glands, and other particulars, except that (1) the median lobes have the inner slope long, straight nearly to the base (in *crawii* obtusely angled about the middle), and conspicuously though minutely crenulate; and (2) the margin beyond the lobes is furnished with one, and then after an interval a group of seven very large spine-like squames. All the spine-like squames are very large. Circumgenital glands; median about 27, cephalolaterals about 57, caudolaterals about 31.

This appears to be only a variety of the Asiatic *D. crawii*. It is easily known from *D. pentagona* and *D. auranticolor* by the inequilateral median lobes, with a long inner slope.

(6). *Diaspis pentagona*, Targioni.—Pietermaritzburg, Natal; on peach.

(7). *Chrysomphalus rossi* (Maskell).—Durban, Natal; on presumed *Eucalyptus*.

(8). *Chrysomphalus phenax*, n. sp.

♀. Scale dark grey, resembling an oyster, with the sublateral exuviae shining black. ♀. No circumgenital glands; anal orifice

small, about $9\ \mu$ long, oval, about $63\ \mu$ from bases of median lobes; lobes four, crenulate, shaped as in *C. mimosa*, but the median lobes are broader, angular instead of sloping on the outer side; margin beyond the lobes denticulate and finely crenulate; club-shaped thickenings at inner bases of median lobes, about twice length of lobes; a pair of thickenings between first and second lobes, as in *mimosa*: three thickenings between second and third lobes, the middle one longest; two at interval between third and fourth lobes, the middle one being absent; one or two beyond the fourth.

Hab. On bark of branches of *Mimosa*, Verulam, Natal (Fuller, No. 9). With *Lophococcus mirabilis*. This, in its scale and other characters, is so very like the Mexican *C. mimosa*, Comstock, that I was not perfectly sure it was distinct. I sent some to the Department of Agriculture at Washington, and Mr. Kotinsky kindly compared them with Comstock's types of *mimosa*; he found the differences to be constant, and the species clearly distinct.

Pseudaonidia clavigera, n. sp.

♀. Scale, $2\frac{1}{2}$ mm. diam., moderately convex, blackish, entirely covered by the epidermis of the twig, except the small shining sub-lateral orange-ferruginous exuviae.

♀. No circumgenital glands, even when full of embryos. Similar to *P. tessarata*, but the median lobes are scarcely notched on the inner side; the second and third lobes are narrower (width of second lobe $8\ \mu$ in *clavigera*, 18 in *tessarata*); margin beyond fourth lobe serrate as if with many small lobes; two large round spaces below the incisions laterad of the median lobes, which, properly focussed, give the appearance (with the incisions) of the club-shaped processes of *Howardia biclavis*; anal orifice further from hind end, being 111 to $129\ \mu$ distant from the tips of the median lobes (in *tessarata* $84\ \mu$).

Hab. Durban, Natal, on twigs of camellia in the Botanic Gardens (Fuller, No. 1). The appearance of the scales, covered by the bark, and the club-shaped processes, strongly suggest the genus *Howardia*. There is also some evident affinity with *Aspidiotus moorei*, Green. The genus *Pseudaonidia* seems to be sufficiently distinct, including the following forms described under *Aspidiotus*:—*P. theae* (Maskell); *P. theae rhododendri* (Green); *P. duplex* (Ckll.); *P. paeoniae* (Ckll. as var. of *duplex*); *P. trilobitiformis* (Green); *P. tessarata* (De Charmoy).

Hemichionaspis cyanogena, n. sp.

♀. Scale about or hardly 2 millim. long, slightly convex, white; narrow, with much the outline of *H. theae*; exuviae orange, varying to pale yellowish.

♂. Scale of the usual form, not carinate.

♀. Differs from *H. minor* as follows:—Lateral margins of segments not produced; median lobes not so produced, shaped more as in *H. mussaenda*, the two lobes together $27\ \mu$ broad and $12\ \mu$ long; spine-like squames more numerous, the formula (following the method

of Cooley) 1, 2 or 3, 2, 2, 2; first two rows of dorsal glands not wholly absent, but represented by one to three glands, third and fourth rows with posterior groups numbering about five. After boiling in liquor potassæ the insect exhibits a very fine blue pigment; median lobes remain yellow after boiling; genital and anal orifices opposite; outer edge of median lobes with three large crenulations; second lobe represented by two small rounded lobules, third by a rather large low lobule, or practically wanting; antennæ represented by a strong bristle on a small tubercle. Embryos in female very large, $231\ \mu$ long; eyes blue. Eggs about $300\ \mu$.

Hab. On small branches of a plant not identified, Durban, Natal (Fuller, No. 17).

Lophococcus, n. g.

A genus of Monophlebinae Coccidæ, allied to *Monophlebus*, which becomes fixed in the adult female state, with a strongly chitinous skin, and has a large erect spine in the middle of the back, this spine originating as an elevated fold of the skin. No ovisac. Type, *L. mirabilis*.

(To be continued.)

NOTES AND OBSERVATIONS.

ON REARING ACHERONTIA ATROPOS.—The uncertainty of the emerging of the perfect insect from the pupa of *A. atropos* is well known, and various methods of treatment are from time to time advocated as likely to produce a satisfactory result. This uncertainty exists no doubt in a state of nature, as well as when the insect is bred in confinement, and what it is that causes or regulates it is, so far as I know, unknown. The following data may be perhaps of interest:—Early in August last (1900) I had three full-grown caterpillars brought to me from different localities in this district; all three were supplied with earth, and “went down” almost immediately. About the end of September I carefully raised the pupæ to the surface of the earth, where they remained uncovered. One very soon showed its failure by becoming mouldy, and another came out a cripple some time in October; the third remained until the 11th of this month (July, 1901), when it emerged in perfect condition, a very fine and large specimen, measuring just under five inches in the expanse of the wings. There was not at any time any application of moisture to the pupæ, nor special exposure to any higher temperature than that of the room, heated with an ordinary fireplace. I attribute the “failure” of one of the above pupæ to an evident injury received by the caterpillar before it was brought to me; the “cripple” was probably owing to there not being in the cage anything for the freshly emerged moth to climb upon (a necessity, I fancy, for the perfect expansion of the wings); this was provided for in respect to the third and successful emergence. —(Rev.) O. PICKARD-CAMBRIDGE; Bloxworth Rectory, July 16th, 1901.

BUFF-COLOURED AMPHIDASYS BETULARIA.—As the question of the buff variety of *A. betularia* has again cropped up, I may say that many years ago I experimented on dead specimens of the ordinary colour, and found that exposure to the vapour of chlorine altered them to this buff colour. At the same time I was unable to alter the forms *doubledayaria* in a similar way to the Lancashire buff varieties.—PHILIP B. MASON; Burton-on-Trent, July 3rd, 1901.

[As previously stated (*ante*, p. 180), I have two buff examples of *A. betularia*, and notice that the antennæ still remain of the normal coloration—*i. e.* entirely black in the male, and black ringed with whitish in the female. It would be interesting to know if the antennæ of other buff specimens of this species are black or buff.—R.S.]

LYCÆNA CORYDON PROTECTED BY RESEMBLANCE.—On July 17th last, near Newland's Corner, on the North Downs, a male specimen of *L. corydon* was noticed in the evening having taken up a position of rest on the flower-head of a small plantain (probably *Plantago media*). The markings of the under-surface of the wings caused the insect to be remarkably well protected by resemblance in the position it had assumed.—W. J. LUCAS; Kingston-on-Thames.

CAPTURES AND FIELD REPORTS.

ENTOMOLOGICAL NOTES FOR JUNE, 1901.—I have succeeded in rearing the larvæ of *Nemeobius lucina*, which, as I mentioned last month, emerged from ova on June 4th. At the present time they are nearly full grown, and I am wondering whether the imagines will appear this year. The first of my *Vanessa polychloros* larvæ fixed itself up to the muslin cover of the cylinder on June 10th, and the imago appeared on June 29th—*i. e.* forty-seven days from the hatching of the larva from the ovum. The rest of them came out on June 30th, but unfortunately several specimens are rather below the normal size; some, however, are very fine. I was fortunate enough to see both the process of pupating and that of the exit of the imago from the pupacase. It was most amusing to see the pupa get rid of its old larval-skin, by butting at it till it fell down. Two of the larvæ, after having hitched up successfully, were unable to burst the skin, and consequently shrivelled up and died. They were apparently just as healthy as the rest, in fact I could detect no difference in them; but, though they struggled hard and long, they finally succumbed. The imago took exactly twelve minutes to arrive at its full size with expanded wings; and all the time the process was going on it kept curling and uncurling its proboscis, which, as far as I could see, was in two parts all the time, not joining together until the growth of the wings was complete. I have been rearing a number of larvæ of *Ennomos fuscantaria*, and their emergence from the ova was spread over three weeks; only on two occasions did more than one larva come out on the same day. The first one pupated on June 21st, and another is about to do so to-day (July 4th), but several of the larvæ are still quite small. On June 28th I got a number of *Lycæna minima (alsus)* from a disused

chalk-pit near here; they are in excellent condition, and very plentiful this year. On June 27th and several following days, when the sun has been shining, *Macroglossa stellatarum* has been observed hovering over a sweet-william flower in my garden, but I have never been near enough to take it. On June 30th a lot of *Selenia tetralunaria* came out; they are very fine specimens, and I have succeeded in pairing a couple, and in obtaining some ova for the second brood. The larvæ emerged on May 20th, and fed up very quickly, for they began to pupate on June 11th. I have also been very successful in rearing a brood of *Catocala sponsa*. When the young larvæ appeared, on April 23rd, I experienced great difficulty in finding oak leaves for them, as the trees were very backward; but I succeeded in getting some buds, which lasted till the leaves grew a little. The larvæ were full-fed on May 28th, and the imagines began to appear on July 1st, two or three having come out each morning since.

Many larvæ this year seem to be much in advance of what they were last year. For instance, my larvæ of *Smerinthus populi* are full grown now, and are going down to pupate; last year they did not emerge from ova till June 25th, and the first one pupated on July 30th. It is the same with *Sphinx ligustri*, *Smerinthus tilie*, and *S. ocellatus*, each one being from a fortnight to three weeks earlier this year. I have noticed the same thing with many of the Diurni, especially *Lycæna alsus*, *L. adonis*, *L. astrarche*, *Hesperia sylvanus*, *Vanessa urticae*, and *V. polychloros*. A friend of mine saw a specimen of *V. atalanta* yesterday, and I am told that *Colias edusa* was seen a few days ago, but cannot absolutely vouch for this statement.

I should be glad if any reader of this Journal, who happens to observe *C. edusa* or *C. hyale* within easy distance of Dorking during August, would be good enough to send me a post-card.—F. A. OLDAKER; Parsonage House, Dorking, July 4th, 1901.

CHARICLEA UMBRA (MARGINATA) AT SUGAR.—This species has occurred occasionally at sugar here during the last week or so. I have taken eight fine examples, and I believe several more have been taken by other enthusiasts at the same place. I can find no record of *C. marginata* having occurred here before.—A. J. LAURANCE; Bromley Common, Kent, July 11th, 1901.

PLUSIA MONETA AT BROMLEY, KENT.—A very fine female specimen of this species came to light at my residence on July 1st, and was fortunately captured. On July 17th I netted a specimen as it was flying over a bramble blossom within a few yards of the house. There is some *Delphinium* near by, so probably many more may be captured in the near future.—ALFRED J. LAURANCE; 8, Cross Roads, Bromley Common.

PLUSIA MONETA IN HAMPSHIRE.—A specimen of *P. moneta* has been taken here whilst hovering over flowers of *Delphinium*.—G. M. RUSSELL; Porchester, July 25th, 1901.

LYCÆNA MINIMA IN WARWICKSHIRE.—On Saturday last, June 22nd, I found *Lycæna minima* (*alsus*) in fairly large numbers at Stockton, about eight miles from here, on the banks of a chalk pit, where *Anthyllis*, its food-plant, grows in great abundance. I see that neither Newman, Morris, Kirby, nor any other authority that I have consulted

mentions this butterfly as occurring in Warwickshire.—D. T. GARRETT; School House, Rugby, June 26th, 1901.

ACRONYCTA ALNI TAKEN AT REST.—On June 8th, 1901, I took a specimen of *Acronycta alni* at rest on some nettles. I have never heard of one being taken at rest before.—R. A. McLEOD; The Myrtles, Great Malvern.

VANESSA URTICÆ ATTRACTED BY LIGHT.—On July 11th two *V. urticae* came to light through a window between 10 and 11.30 p.m.—R. A. McLEOD.

ENISTIS (GNOPHRIA) QUADRA IN DUBLIN.—To-night (July 18th) I had the pleasure of taking a female specimen of *Enistis quadra* on the pavement under one of the electric lights in this road. As I see in Barrett's 'Lepidoptera' that only one specimen appears to have been recorded from Ireland previously, I think you may consider the fact worthy of record, especially, perhaps, considering the locality, as it is scarcely an insect I should have looked for in a large town.—WILLIAM C. E. WHEELER; St. Helen's School, 23 and 25, Pembroke Road, Dublin. [For other Irish localities, see Entom. xxxiii. 331.—ED.]

OXYGASTRA CURTISHI TAKEN IN HANTS.—Odonatists, if I may use the term, will be pleased to hear that the extremely scarce dragonfly, *Oxygaster curtisii*, is still with us. I have received a nice male taken by Major Robertson early in July last in its old locality in Hants. Another specimen was seen, but was not secured. The last recorded capture was in 1882, on July 11th, when Mr. Goss took four males. *O. curtisii*, once thought to be peculiar to Britain, has a limited distribution in Western Europe. It somewhat resembles *Cordulia aenea*, but may be known by the middorsal line of orange-yellow spots.—W. J. LUCAS; Kingston-on-Thames.

DEIOPEIA PULCHELLA IN THE LONDON DISTRICT.—On July 1st last, I had the pleasure of taking a specimen of *Deiopeia pulchella* on a piece of waste ground in the London district. It was unfortunately slightly damaged. I believe this a rather rare occurrence.—E. A. WARNE; 4, Spanish Road, East Hill, Wandsworth, S.W., July 7th, 1901.

[An example of this species was captured in a North London locality on June 31st, 1892: *vide* Entom. xxv. 154, 166.—ED.]

SPHINX CONVULVULI IN 1901.—Mr. H. Pestell, of Elstow, near Bedford, recently captured four specimens of *S. convolvuli* at honeysuckle. Three females were taken on June 30th, July 2nd, and 10th, and a male on July 11th. The females were slightly worn, but Mr. Pestell tells me the male is fresh, and he thinks only recently out of the pupa. It seems impossible that these specimens are from larvæ fed this year. They are therefore hibernated specimens, or from pupæ which failed to emerge last autumn. I once captured a specimen on August 11th, which was the earliest occurrence I have previously heard of.—W. GIFFORD NASH; Bedford.

On July 16th a specimen of *S. convolvuli* was brought in by a lad, who found it in his garden at Wandsworth. I took an example on West Hill, Wandsworth, August 13th, 1900.—J. MILLER; 44, Longfield Street, Wandsworth, S.W.

VARIETY OF *EUCHLORIS* (*PHORODESMA*) *PUSTULATA*.—While beating for *Geometræ* on the 3rd inst., I took, among other insects, two male *Euchloris pustulata* (an insect not uncommon here), in which the whole of the parts usually coloured green (including portions of the abdomen) were replaced by a delicate pink. The tornal blotches, &c., retain their normal position and colour, though naturally appearing less conspicuous. I may mention that there is no chemical action involved, as the insects were thus coloured while alive. Further, I always use chloroform, so there can be no question of the colouring being due to the action of cyanide or ammonia.—J. AYLWARD CHURCHILL; The Brick House, Billingshurst, Sussex.

THECLA W-ALBUM IN SHROPSHIRE.—While gathering the seeds of wych-elm here on May 28th, for larvæ of *Xanthia gilvago* and *X. ferruginea*, I found that I had taken two larvæ of *Thecla w-album*, one of which has since pupated. I believe the only previous record of this butterfly in Shropshire is that by Mr. C. G. Barrett, who found it thirty-five years ago on Benthall Edge. Having previously found and bred the larva in some abundance near Burton-on-Trent, I think I can hardly be mistaken as to its identity.—(Rev.) CHAS. THORNEWILL; Calverhall Vicarage, Whitchurch, Salop, June 6th, 1901.

SOCIETIES.

SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—*June 13th, 1901.*—Mr. H. S. Fremlin, F.E.S., President, in the chair.—Messrs. R. A. Adkin, Lingards Road, Lewisham, S.E.; R. Armstrong, Granville Park, Lewisham; A. W. Dodds, Stoke Newington; and W. Thornthwaite, Hersham, were elected members.—Mr. R. Adkin exhibited living larvæ of *Acidalia marginepunctata* feeding on yarrow, and pointed out that the genus *Acidalia* needed considerable revision.—Mr. Kemp, the Coleoptera *Rhagium bifasciatum*, *Donacia bicolora*, *D. sericea*, *D. semicuprea*, *D. simplex*, *D. cinerea*, and *D. discolor*; all taken at the field meeting at Byfleet on June 1st.—Dr. Chapman, the curious pupal burrow of *Scardia boleti*, showing the peculiarly constructed trap-door; and also the cocoon of *Lagoa crispata*, which shows a trap-door arrangement.—Mr. Lucas read the Report of the Field Meeting held at Oxshot on May 18th.—Mr. Adkin gave an account of the Annual Meeting of the South-Eastern Union of Scientific Societies held at Haslemere.

June 27th.—Mr. F. Noad Clark, Vice-President, in the chair.—Mr. A. W. Pepper, of Horniman's Museum, Forest Hill, was elected a member.—Mr. Ashdown exhibited specimens of *Anax imperator* and *Ischnura pumilio* taken in the New Forest, and which he afterwards placed in the Society's collection.—Mr. Turner, an almost black specimen of *Amphidasys betularia* taken in Camberwell. Several other similar examples were also reported.—Mr. West, the following Hemiptera from the river Ravensbourne:—*Microvelia pygmæa*, developed forms; *Gerris odontogaster*; *G. najas*; and *Hydrometra stagnorum*, developed and undeveloped forms.—Mr. Enock, bred specimens

of *Libellula depressa* and *L. quadrimaculata*, with var. *prænnibila*: also larvæ of *Thecla betulæ*; all were collected at Epping.—Mr. Harrison, long series of *Amphidasys betularia*, including six gynandrous specimens, all bred from ova laid by a New Forest parent.—HY. J. TURNER, *Hon. Rep. Sec.*

BIRMINGHAM ENTOMOLOGICAL SOCIETY.—June 17th, 1901.—Mr. H. Willoughby Ellis, Vice-President, in the chair.—Mr. Wainwright showed a specimen of the rare Dipteron, *Brachypalpus bimaculatus*, Meq., taken at West Malvern in Whitsun week, 1901.—Mr. H. W. Ellis exhibited the following Coleoptera:—*Cychrus rostratus*, from Dovedale; *Pterostichus striola*, with its eggs, also from Dovedale; *Phytodecta rufipes* and *Apoderus coryli*, both from Knowle; and *Elatér pomorum*, from Cannock; also the curiously coiled-up leaves in which are laid the eggs of *Attelabus curculionoides* and *Deporaus betulæ*.—Mr. A. D. Imms showed an immature specimen of *Phyllodromia germanica*, taken in the University Buildings, Birmingham, and said that he believed it to be the first known midland specimen.—Mr. A. H. Martineau said that he had taken male and female of the rare ant, *Myrmecina latreillii*, at Cannock Chase, the nearest place from which he had it before being Selsley, Glos.—Mr. R. C. Bradley showed *Anisopteryx æscularia*, taken in the city boundaries near Cannon Hill.—Mr. G. W. Wynn, long and nice series of *Teniocampa gracilis*, *T. instabilis*, *T. rubricosa*, all taken at sallows at Hampton-in-Arden this year; also *Cucullia chamomillæ*, from Marston Green.—COLBRAN J. WAINWRIGHT, *Hon. Sec.*

RECENT LITERATURE.

D. J. SCOURFIELD. *The Swimming Peculiarities of Daphnia and its Allies, with an Account of a New Method of examining living Entomostraca and similar Organisms.* (1900, Journ. Quekett Microsc. Club (2), vii. pp. 395–404; seven text figures.)

ALTHOUGH papers upon Crustacea do not strictly come within the scope of the 'Entomologist,' Mr. Scourfield's interesting biological contribution may be studied with advantage by workers at other groups of aquatic Arthropoda.

In addition to the morphological distinctions between the four genera into which *Daphnia* of the older authors is now divided, the author points out a fundamental difference in the swimming habits of *Daphnia* and *Ceriodaphnia*, on the one hand, and *Simocephalus* and *Scapholeberis* on the other, the two former always swimming either vertically or obliquely back uppermost, the two latter always swimming more or less obliquely back downwards, so constantly so that it is impossible to mistake a swimming *Daphnia* for a swimming *Simocephalus*, even with unaided vision. To ascertain the causes of these differences, a method—detailed at length—was devised "of suspending the animals by the top of their heads in such a way that they could use their antennæ and all other organs with perfect freedom, and yet not alter their position in the water." This proved that the direction of the

stroke of the large antennæ was as nearly as possible identical in all the specimens examined. Two accidents, however, led to an inkling of the truth. In one case a *Daphnia*, who had some sealing-wax cement (used in an unsuccessful experiment) left attached to the head, was observed to have a tendency to swim somewhat obliquely back downwards, thus imitating the normal progression of a *Simocephalus*. In the other, an air-bubble had penetrated the brood cavity of a *Simocephalus* in consequence of the latter having been left too long upon a glass slip without water. The swimming of the creature "was most curious. It struggled hard against the upward pull of the air-bubble, and by the vigorous use of its antennæ it managed to make some progress in an obliquely downward direction; but it was no longer swimming in the manner of a *Simocephalus*, but . . . with its back upwards. It also clung to the sides of the glass in an inverted position, which is just the opposite to the normal behaviour of animals of the genus. The two cases of abnormal swimming just alluded to, taken in connection with what has been already found out about the direction of the stroke, proved conclusively that the main factor in determining the positions of the animals when swimming freely must be the situation of the centre of gravity." In fact, the position of the animal is due to the net result of gravity and the direction of the stroke (of the antennæ), modified by the speed of the progress, and also by the possession of shell-spines, the most active swimmers—the clear-water forms—having the greatest development of the shell-spine (and even the possession of a head-spine); while *D. pulex* and others, which are normally comparatively sluggish, exhibit short shell-spines.

The paper is illustrated by diagrams showing the directions of the various forces.

G. W. K.

E. P. FELT. *Sixteenth Report Injurious and other Insects*. (1901, Bull. Soc. N. Y. State Mus. vol. vii. No. 36, pp. 949-1063; two coloured and thirteen plain plates (comprising twenty-three photographs), one plan, and two text figures.)

THE New York State Reports have always held a very high place among contributions to economic entomology, though under the care of Dr. Felt their general plan and detailed execution show an improvement even upon the old series. The principal feature of the Sixteenth Report is the record of experimental work with insecticides in fighting scale-insects, especially *Aspidiotus perniciosus*, Comst. This is elucidated by a large plan of an infested orchard, and twenty photographs of infested trees, &c. Two beautifully executed coloured plates illustrate accounts of the gypsy moth (*Porthetria dispar*), and the "Palmer-worm" (the caterpillar of a Gelechiid, *Ypsolophus pometellus*, Harris). The relaxation of the efforts of the Massachusetts Commonwealth towards the extermination of the gypsy moth leads to the fear that it is only a question of time before its destructive powers will be felt in New York State. One of the most remarkable photographs is plate 16, showing forest-tent caterpillars (*Clisiocampa disstria*) clustered on a tree-trunk.

G. W. K.

D. J. SCOURFIELD. *The Logarithmic Plotting of certain Biological Data.* (1897, Journ. Quekett Microsc. Club, pp. 419-23, pl. xx.)

THE author advocates the use of logarithmically ruled sectional paper for the graphic representation of certain biological data. This paper is produced by "first of all drawing a series of lines at *equal* distances apart, according to any convenient scale, representing, say, the series of numbers 1, 10, 100, 1000, 10000, &c., the logarithms of which are 0, 1, 2, 3, 4, &c., respectively, and then dividing the spaces so obtained *unequally* by lines drawn at distances equal to .3010, .4771, .6021, .6990, .7781, &c., which are the logarithms of the numbers 2, 3, 4, 5, 6, &c." It is not possible to give an adequate idea of the method of procedure without reprinting the whole of the tersely written paper, but attention is drawn to it as likely to be of some use to those entomologists who are investigating exhaustively such phenomena as variation, &c.

G. W. K.

Economic.—E. P. FELT. *Illustrated Descriptive Catalogue of some of the more important Injurious and Beneficial Insects of New York State.* (1900, Bull. Soc. N. Y. State Mus. viii. No. 37, pp. 1-52, eighty-three text figures.)

E. E. GREEN discusses "Some Caterpillar Pests of the Tea-Plant" (September, 1900, Circular, Botan. Gardens, Ceylon (1), 19, pp. 239-65). Eleven species are described, and remedial measures discussed. The importance of being beforehand with the caterpillars, and of stamping out the earlier broods before they have time to breed and extend their area of operation, is emphasized.

Lepidoptera.—N. KUSNEZOV describes the protective coloration of the wings of the Crimean *Libythea celtis*, and figures its attitude in repose, which exactly resembles a dead leaf, the antennæ and palpi being made use of in the simulation (the butterfly being unique in this respect). (Horæ Entom. 1900, xxxv. ; summary and figure in 'Psyche,' 1901, pp. 184-5.)

Neuroptera.—G. A. POUJADE notes a female French Odonate (*Cordulegaster annulatus*, Latr.), in which the left antenna is composed of three unequal bristles, articulated on a single large and deformed scape, while the right antenna is normal (1899, Bull. Soc. Ent. France, pp. 44-5, two figures).

Orthoptera.—M. V. SLINGERLAND records the discovery for the first time in America of a European beneficial insect, *Mantis religiosa* (1900, Entom. News, p. 18 ; see also *l. c.* 1899, pp. 288-9, under the name of *Stagmomantis carolina*).

CHR. AURIVILLIUS describes forty-two species of Swedish Orthoptera, of which about twenty-eight also occur in the British Isles ("Svensk Insektafauna 2 Orthoptera" in Ent. Tidskrift, 1900, xxi. pp. 233-54, fourteen text figures).

G. W. K.

OBITUARY : ELEANOR A. ORMEROD, LL.D.

WE regret to have to chronicle the death of this gifted lady, who has spent the greater part of her life on the study and practical application of entomology.

Her father was George Ormerod, D.C.L., F.R.S., author of the 'History of Cheshire,' who came of an old Lancashire family, the Ormerods of Ormerod. She was a student of natural history from quite early age, and as her father advanced in years she took an active part in the management of his farm and property, Sedbury Park, Gloucestershire, beautifully situated, opposite to Chepstow. This gave her practical knowledge of agriculture; and here was the seed plot from which so much good fruit was to ripen.

Dr. Robert Wallace, Professor of Agriculture in the University of Edinburgh, writes to us:—"The name of Miss Eleanor A. Ormerod is widely known among all classes of the community, and the excellent quality of her work is recognised and appreciated by those who are specially interested in the scientific aspect of it. But the magnitude and true value of her gratuitous labours from the practical point of view of the farmer are probably not sufficiently understood by the general public. Twenty-four voluminous Annual Reports have appeared; and the following standard works have been issued from time to time:—'A Manual of Injurious Insects, with Methods of Prevention and Remedy' (two editions); 'Handbook on Insects Injurious to Orchard and Bush Fruits'; 'Observations on Injurious Insects of South Africa'; a 'Guide to Methods of Insect Life'; and a 'Text-Book of Agricultural Entomology,' &c. Free gift copies of the Annual Report were sent to all correspondents who supplied any of the information adopted. Besides what may be termed substantial publications, many four-page leaflets on the common farm pests were prepared with, in each case, an illustration of the creature described, and gratuitously circulated to meet a rapidly growing demand for guidance among farmers and stockowners. Among these were issued accounts of the widely destructive wireworm and equally destructive grub of the crane fly, or daddy longlegs; the mangel-leaf maggot; the mustard beetle; the minute stem eelworm (invisible to the naked eye), which produces 'Tulip-root' in grain crops, and is largely responsible for the condition known as 'clover sickness'; the troublesome forest fly, which her recent investigations showed to be present in two other districts besides that of the New Forest in Hampshire; and the 'Warble Fly, its history and easily practicable methods of prevention and remedy.' Of the last-named leaflet, 155,000 copies were circulated at her own expense. From letters in my possession, as the editor of Miss Ormerod's Reminiscences, it is clearly shown that by her numerous distinguished foreign correspondents she was universally acknowledged to be the greatest authority on economic

entomology that this country has possessed in recent years, and one of the inner circle of the highest authorities in the world."

Only last year the University of Edinburgh conferred on her the LL.D., the highest honorary distinction of merit within its power. This was the first time a lady had received such an honour in the Scottish capital. Sir Ludovic Grant, the Secretary to the Senatus, in presenting Miss Ormerod to the Vice-Chancellor, said:—

"A duty now devolves upon you, Sir, which has devolved upon none of your predecessors, and of which the performance will render the present occasion memorable in the annals of the University. Our roll of Hon. Graduates in Law contains the names of many illustrious men, but you will search it in vain for the name of a woman. To-day, however, a new roll is to be opened—a roll of illustrious women; and it is matter for congratulation that this roll should begin with a name so honoured as that of Miss Ormerod. The pre-eminent position which Miss Ormerod holds in the world of science is the reward of patient study and unwearying observation. Her investigations have been chiefly directed towards the discovery of methods for the prevention of the ravages of those insects which are injurious to orchard, field, and forest. Her labours have been crowned with such success that she is entitled to be hailed as the protectress of agriculture and the fruits of the earth—a beneficent Demeter of the nineteenth century. It would take long to enumerate her contributions to Entomological and Phenological literature, but I may select for mention the valuable series of Reports extending over twenty years, the preparation of which involves correspondence with all parts of the world. Remarkable too is the list of the honours which she has received. She was the first lady to be admitted a Fellow of the Royal Meteorological Society, and she has been awarded the Silver Medal of the 'Société Nationale d'Acclimatation' of France. To these distinctions the University of Edinburgh, sensible of her conspicuous services, and not unmindful of her generous benefactions, now adds its Doctorate in Laws."

The Annual Report of Injurious Insects published this year contains a note of farewell. She had lived to see her work finished. The histories of our worst insect pests had been gradually completed. It was only by almost heroic energy and determination that she had replied, in full and courteous manner, to constant inquiry; and now the time had come for a mere reference to published information. She had been collecting reminiscences of her early life; retirement would give opportunity for preparing these for publication, and this became for a few months her chief interest. Then came serious illness, and, though the mind remained strong and clear, the bodily powers had failed. Death took place on the 19th July; she was seventy-three years old. So passed away a life of altruism, whose loss will be mourned both far and near.—T. P. N.

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THE NEW EDITION OF "STAUDINGER'S CATALOGUE."*

SINCE the second edition of this valuable Catalogue of Lepidoptera was published, now some thirty years ago, quite a number of changes in nomenclature, and some new arrangements of families and genera have been proposed, and to some extent accepted by lepidopterists.

In the most recent systems of classification the sequence of families is regulated by their supposed relationship, and it follows that authors, when investigating different sets of facts, may very justly arrive at quite opposite phylogenetic conclusions, and, as a consequence, their systems may be antagonistic. The structural characters of the perfect moth or butterfly afford excellent material for the purpose of the systematist, but it must be admitted that such material is not all-sufficient, and often leaves the true position of certain units in a scheme doubtful. Our knowledge of the earlier stages of Lepidoptera is ever increasing, and the work effected by specialists in this field of investigation is most valuable, as it serves to modify or disprove some of the conclusions arrived at by those who depend on imaginal characters alone. Very much more work on ova, larvæ, and pupæ of Lepidoptera will, however, have to be done, before a classification based on the earlier stages can rank as high as one drawn from a study of the imagines. Classification, then, being in a state of transition, it is evident that no very considerable disturbance of the old order of arrangement in our Catalogues is desirable or expedient. If the most natural sequence of families, &c., at present possible is still only of a tentative character—and it is presumed that absolute finality is not claimed for any of the later systems—the middle course adopted in the work under notice is in every way the best. No one having a knowledge of the complex nature of the subject would suppose that a faultless scheme could be evolved from the facts at present available.

It may safely be said that lepidopterists generally will feel grateful that the aim has been to place the third edition of the 'Catalog' in

* *Catalog der Lepidopteren des Palæarctischen Faunengebietes.* Von Dr. Phil. O. STAUDINGER und Dr. Phil. H. REBEL. Dritte Auflage des Cataloges der Lepidopteren des Europäischen Faunengebietes. Berlin: R. Friedländer & Sohn. May, 1901.

line with modern requirements, without introducing any very revolutionary changes, either in the arrangement of families and genera, or of the names of species.

The old terms of "Macro-lepidoptera" and "Micro-lepidoptera" are discarded, but the 'Catalog' is still arranged in two parts as before. Theil I., for which the late Dr. Staudinger was mainly responsible, contains the species previously referred to as Macro-lepidoptera, and these are distributed among thirty-nine families, five of which are divided into subfamilies. The families are placed in the following order :—

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| 1. Papilionidæ | 16. Brahmæidæ | (d) Orthostixinæ |
| 2. Pieridæ | 17. Bombycidæ | (e) Boarmiinæ |
| 3. Nymphalidæ | 18. Drepanidæ | 26. Uraniidæ |
| (a) Nymphalinæ | 19. Callidulidæ | 27. Epiplemidæ |
| (b) Danainæ | 20. Thyrididæ | 28. Nolidæ |
| (c) Satyrinæ | 21. Noctuidæ | 29. Cymbidæ |
| 4. Libytheidæ | (a) Acronyctinæ | 30. Syntomidæ |
| 5. Erycinidæ | (b) Trifinæ | 31. Arctiidæ |
| 6. Lycænidæ | (c) Gonopterinaæ | (a) Arctiinaæ |
| 7. Hesperiidæ | (d) Quadrifinæ | (b) Lithosiinaæ |
| 8. Sphingidæ | (e) Hypeninaæ | 32. Heterogynidæ |
| 9. Notodontidæ | 22. Agaristidæ | 33. Zygaenidæ |
| 10. Thaumetopoeidæ | 23. Cymatophoridæ | 34. Megalopygidæ |
| 11. Lymantriidæ | 24. Brephidæ | 35. Cochlididæ |
| 12. Lasiocampidæ | 25. Geometridæ | 36. Psychidæ |
| 13. Endromididæ | (a) Geometrinæ | 37. Sesiidæ |
| 14. Lemoniidæ | (b) Acidaliinaæ | 38. Cossidæ |
| 15. Saturniidæ | (c) Larentiinaæ | 39. Hepialidæ. |

Theil II., by Dr. Rebel, comprises the "Micro-lepidoptera," and the families, eighteen in number, are as under :—

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|--------------------|----------------------|------------------------|
| 1. Pyralidæ | (a) Choreuthinaæ | 11. Gracilariidæ |
| (a) Galleriinaæ | (b) Glyphipteryginaæ | (a) Gracilariinaæ |
| (b) Crambinaæ | (c) Douglassinaæ | (b) Lithocolletinaæ |
| (c) Schoenobiinaæ | 6. Yponomeutidæ | 12. Lyonetiidæ |
| (d) Anerastiinaæ | (a) Yponomeutinaæ | (a) Lyonetiinaæ |
| (e) Phycitinaæ | (b) Argyrorethinaæ | (b) Phyllocnistinaæ |
| (f) Epipaschiinaæ | 7. Plutellidæ | 13. Nepticulidæ |
| (g) Chrysauginæ | (a) Plutellinaæ | 14. Talæporiidæ |
| (h) Endotrichinaæ | (b) Orthoteliinaæ | 15. Tineidæ |
| (i) Pyralinaæ | 8. Gelechiidæ | (a) Atychiinaæ [iinaæ] |
| (k) Hydrocampinaæ | (a) Gelechiinaæ | (b) Ochsenheimer- |
| (l) Scopariinaæ | (b) Blastobasinaæ | (c) Acrolepiinaæ |
| (m) Pyraustinaæ | (c) Ecophorinaæ | (d) Setomorphinaæ |
| 2. Pterophoridæ | 9. Tinægeriidæ | (e) Lypusinaæ |
| 3. Orneodidæ | 10. Elachistidæ | (f) Teichobiinaæ |
| 4. Tortricidæ | (a) Scythridinaæ | (g) Tineinaæ |
| (a) Tortricinaæ | (b) Momphinaæ | (h) Adalinaæ |
| (b) Conchylinæ | (c) Heliozelinaæ | 16. Crinopterygidæ |
| (c) Olethreutinaæ | (d) Coleophorinaæ | 17. Eriocraniidæ |
| 5. Glyphipterygidæ | (e) Elachistinaæ | 18. Micropterygidæ |

The number of species enumerated in Theil I. is 4744, which, with 13 given in the Addenda, make a total of 4757 as against 2854 in the second edition. In Theil II. there are 4962 species, including 180 in the Addenda, thus exceeding the total in the corresponding part of the 1871 'Catalog' by 1735.

These very considerable additions are largely due to the extended eastern and southern limits of the region embraced under the term Palæarctic. Formerly Dr. Staudinger drew the eastern line at the Amur, but now Ussuri is included, and in many cases Northern China, Corea, and Japan also.

The changes adopted in genera and in specific names, so far as concerns British species, will be found in the list at the end of these remarks. It may, however, be mentioned here, that the somewhat unwieldy genera—*Agrotis*, *Cidaria* (changed to *Larentia*), and *Acidalia* are still retained, and not even sectionized as formerly, although a very much larger number of species are referred to each of them. In *Agrotis*, for example, there are now 304 species, whilst in the second edition there were only 171. In the matter of genera there probably will never be a time when perfect unanimity will prevail. We shall always have "splitters" and "lumpers"; the former will continue to found new genera, or to drag forth the dead ones; and the latter will re-inter many of the defunct, and deal summarily with the newly created. These differences of opinion among the doctors are apt to confuse and perplex the student, but they make for progress in the end.

A retrogressive step seems to be that many names which appeared in the synonymy in the second edition have been dropped out without in any way being accounted for, so that workers will still have to refer to the second edition, as well as to the third, to obtain full synonymy.

We have little doubt that this new edition will be as generally accepted and as widely adopted as was that which it now supersedes. The 1871 'Catalog' was of the utmost service to the student of the lepidopterous fauna of Europe, but the revised and extended edition will be simply indispensable to those who are interested in Palæarctic Lepidoptera.

The more important changes in nomenclature among British species of "Macro-Lepidoptera" are for the most part concerning genera, and are as given below:—

Leptidia sinapis for *Leucophasia sinapis*.

Polygonia c-album for *Vanessa c-album*.

Epinephele ianira, L., changed to *E. jurtina*, L.

Aphantopus hyperanthus for *Epinephele hyperanthus*.

Callophrys rubi for *Thecla rubi*.

Zephyrus quercus and *Z. betulæ* for *Thecla quercus* and *T. betulæ*.

Chrysophanus dispar and *C. phlæas* for *Polyommatus dispar* and *P. phlæas*.

Lampides beticus for *Lycæna bætica*.

Lycæna argus, Linn., for *L. ægon*, Schiff.

Cyaniris argiolus for *L. argiolus*.

Pamphila palæmon for *Carterocephalus palæmon*.

Hesperia lineola, *A. thaumas*, and *A. actæon* in *Adopæa*.

- Hesperia comma* and *A. sylvanus* in *Augiades*.
Hesperia malvæ for *Syrichthus malvæ*.
Thanaos tages for *Nisoniades tages*.
Dilina tiliæ for *Smerinthus tiliæ*.
Daphnis nerii for *Deilephila nerii*.
Protoparce convolvuli for *Sphinx convolvuli*.
Hyloicus pinastri for *Sphinx pinastri*.
Deilephila celerio and *D. elpenor* in *Chærocampa*.
Metopsilus porcellus for *Deilephila porcellus*.
Hemaris fuciformis, L., for *Macroglossa fuciformis*, L. [= *bombyli-formis*, O].
Hemaris scabiosæ for *Macroglossa bombyliiformis*, Esp. [= *fuciformis*, O].
Harpyia bicuspis, *H. furcula*, and *H. bijida* in *Cerura*.
Dicranura vinula for *Harpyia vinula*.
Notodonta tremula (*dictæa*) and *N. dictæoides* in *Pheosia*.
Leucodonta bicoloria for *N. bicoloria*.
Euproctis chrysorrhæa for *Porthesia chrysorrhæa*.
Stilpnotia salicis for *Leucoma salicis*.
Lymantria dispar for *Ocneria dispar*.
Lymantria monacha for *Psilura monacha*.
Bombyx neustria and *B. castrensis* in *Malacosoma*.
Bombyx lanestris in *Eriogaster*.
Bombyx quercus and *B. trifolii* in *Lasiocampa*.
Bombyx rubi in *Macrothylacia*.
Cosmotriche potatoria for *Lasiocampa potatoria*.
Epicnaptera ilicifolia for *Lasiocampa ilicifolia*.
Gastropacha quercifolia for *Lasiocampa quercifolia*.
Craniophora ligustri for *Acronycta ligustri*.
Neuronia popularis and *N. cespitis* in *Epineuronia*.
Dianthæcia luteago var. *argillacea*, Hübn., for *D. luteago* var. *barrettii*, Dbl.
Luperina haworthii and *L. matura* in *Celæna*.
Hadena exulus, Lef. = *diffusa*, Hb., a form of *H. maillardi*, H.-G.
Hadena secalis, Bjerk., for *H. didyma*, Esp. (= *oculea*, Gn.).
Asteroscopus nebeculosa and *A. sphinx* in *Brachionycha*.
Nonagria brevilinea for *Leucania brevilinea*.
Petilampa arcuosa for *Caradrina* (*Hydrilla*) *arcuosa*.
Panolis griseovariegata, Goeze, for *P. piniperda*, Panz.
Pyrrhia umbra for *Chariclea umbra*.
Emmelia trabealis for *Agrophila trabealis*.
Laspeyria flexula for *Aventia flexula*.
Habrosyne derasa for *Gonophora derasa*.
Asphalia diluta, *A. flavicornis*, and *A. ridens* in *Polyplocæ*.
Phorodesma pustulata and *P. smaragdaria* in *Euchloris*.
Thalera lactearia for *Iodis lactearia*.
Hemithea strigata for *Nemoria strigata*.
Ephyra, Dup., for *Zonosoma*, Ld.
Larentia, Tr., for *Cidaria*, Tr.
Asthena for *Cidaria candidata*.
Eupithecia coronata, *E. rectangulata*, and *E. debiliata* in *Chloroclystis*; all other *Eupitheciæ* in *Tephroclystia*.
Cidaria polygrammata, *C. lapidata*, *C. vitalbata*, and *C. tersata* in *Phibalapteryx*.

Cabera pusaria and *C. exanthemaria* in *Deilinia*.
Ennomos, Tr., for *Eugonia*, Hübn.
Hygrochroa syringaria for *Pericallia syringaria*.
Gonodontis bidentata for *Odontopera bidentata*.
Opisthograptis luteolata for *Rumia luteolata*.
Semiothisa, Hübn., for *Macaria*, Curt.
Halia wauaria and *H. brunneata* in *Thamnonoma*.
Scodionia fagaria, Thnbg., for *S. belgaria*, Hb.
Perconia strigillaria for *Aspilates strigillaria*.
Sarrothripus revayana for. *S. undulana*.
Phragmatobia fuliginosa for *Spilosoma fuliginosa*.
Parasemia plantaginis for *Nemeophila plantaginis*.
Diacrisia sanio for *Nemeophila russula*.
Callimorpha quadripunctaria, Poda., for *C. hera*, Linn.
Emydia striata and *E. cribrum* in *Coscinia*.
Hipocrita jacobææ for *Euchelia jacobææ*.
Mitochrista miniata for *Calligenia miniata*.
Endrosa irrorella for *Setina irrorella*.
Cybosia mesomella for *Setina mesomella*.
Comacla senex for *Nudaria senex*.
Cnestis quadra for *Gnophria quadra*.
Pelosia muscerda for *Lithosia muscerda*.
Zygæna purpuralis, Brünlich, for *Z. pilosellæ*, Esp.
Z. filipendulæ var. *hippocrepidis*, Steph., renamed *tutti*, Rbl.

PSYCHIDÆ.

Pachytelia villosella for *Psyche villosella*.
Sterrhopterix hirsutella for *Psyche hirsutella*.
Fumea casta, Pall., for *F. intermediella*, Brd.
Bacotia sepium for *Fumea sepium*.

HEPIALIDÆ.

Hepialus fusconebulosa, De Geer, for *H. velleda*, Hb.

ON THE BRITISH AND FINNISH SPECIES OF THE
 ORTHOPTEROUS GENUS *ACRYDIUM*, GEOFFROY, KIRBY
 (= *TETRIX*, LATR.).

By G. W. KIRKALDY, F.E.S.

IN Finland there are four species of *Acrydium* (= *Tetrix* = *Tettix*), of which two are British. As one very probably, and one possibly, of the other two may occur in Britain, and as the genus has been treated comparatively briefly in the latest notices,* a résumé of a paper on the Finnish species by J. SAHLBERG* may be of interest to British entomologists.

The larvæ, beyond their softer texture, have all their appen-

* J. SAHLBERG, 1893, "Om de finska arterna af orthopterslägtet *Tettix*, Charp.," in 'Ofverstryck ur Sällsk. pro Fauna Fennica Medd.' pp. 43-8; M. BURR, 1897, 'British Orthoptera,' pp. 46-7; BURR, 1898, Entom. p. 127; W. J. LUCAS, 1901, Entom. p. 166, pl. iii.

dages shorter, even of the pronotum, which has a more elevated dorsal keel. The pronotum latero-posteriorly is simply curved, and the keel on the posterior femora is uninterrupted up to the apex.

The *imago* is of firmer texture, has longer appendages, and longer but less elevated pronotum. The latter is bisinuate latero-posteriorly; within the upper of the curves are seen the rudimentary tegmina. The keel on the posterior femora is interrupted before the apex. In the short-winged forms the wings do not reach to the tip of the pronotal extension, although the latter does not extend beyond the apex of the posterior femora. In the long-winged forms the wings reach beyond the pronotal extension, although the latter stretches out far beyond apex of posterior femora.

TABLE OF THE SPECIES.

1. 4. Dorsum of prothorax slightly tectiform, median carina less elevated, somewhat straight in front as seen in profile. Head in front (in profile) angulate, frontal line forming an angle with the vertex.
2. 3. Head apically more acutely produced, frontal line forming a somewhat acute angle with the vertex, distinctly sinuate at the insertion of the antennæ. Intermediate femora with keels slightly undulate, keel of posterior femora (as seen from above) angulate. Posterior metatarsi with small pulvilli, straight beneath, third almost longer than the two preceding together, first distinctly shorter than the second . *A. fuliginosum*, Zett.
- Var. *α*. Brownish black, antennæ widely flavous at the base, lateral spots on the pronotum triangular, more or less distinct, blackish holosericeous . (*fuliginosum*, Zett.)
- Var. *β*. Brownish black, antennæ as in var. *α*; posterior femora with a large transverse rufo-testaceous spot in the middle of the exterior margins . (*fascipes*, Zett.)
- Var. *γ*. Brownish black, antennæ (apex excepted), a broad continuous median stripe on the pronotum, and a line on each side above the base of the wings, yellow; annulations of the anterior tibiæ and three large spots on the posterior femora externally, whitish. On each side of the pronotum there are three large, lateral, blackish holosericeous spots, of which the first, sub-apical, is triangular; the second is larger and trapezoidal, the third posteriorly narrow, sublunate (*pulchella* (Sahlb.))
3. 2. Head less produced apically, frontal line straight, forming a right angle with the vertex. Keels of intermediate femora not undulate, posterior keel (seen from above) not angulate. Posterior metatarsus with pulvilli less depressed, beneath obliquely subrotundate-angulate, third shorter than two preceding together *A. subulatus* (L.)

- a*, Posterior extension of prothorax extending considerably beyond apex of femora. Wings a little longer than prothorax. *Forma macroptera* (= *A. subulatus* (Auct.))
- β*. Posterior extension not or scarcely extending beyond apex of femora. Wings little explicate, a little shorter than prothorax.
Forma brachyptera (= subsp. *A. sahlbergi* (Sauley))
4. 1. Dorsum of prothorax distinctly tectiform, median keel considerably elevated, and anteriorly (seen in profile) roundly-declivous. Head apically somewhat obtuse, frontal line roundly continued on the vertex. Species generally short-winged.
5. 6. Antennæ slender, fourth and fifth segments equal in breadth, four times as long as the middle segments, three times as long as penultimate and middle keel of vertex, in the middle of the apex, reaching a little beyond the lateral keels. Anterior margin of pronotum fairly straight. Posterior metatarsus with obliquely angulate pulvilli. Dorsal spots transversely sublunate-triangular. *A. tenuicornis* (J. Sahlb.)
6. 5. Antennæ somewhat incrassate, fourth and fifth segments strongly, sixth distinctly transverse, penultimate twice longer than wide. Head as in *tenuicornis*. Pronotum with anterior margin distinctly angulate. Posterior metatarsus with insignificant pulvilli, beneath straight. Dorsal spots generally distinctly rhomboidal, anteriorly obliquely placed. *A. bipunctatus* (L.)
- a*. Prothoracic extension extending far beyond apex of femora. Wings explicate, distinctly longer than prothorax. *Forma macroptera*.
- β*. Prothoracic extension reaching apex of posterior femora. Wings not explicate, much shorter than prothoracic process. *Forma brachyptera* (*A. bipunctatus* (Auct.))

It will be seen from the above that the characters relied upon by British workers for the specific differentiation of *subulatus* and *bipunctatus* refer apparently only to the brachypterous form of the former, and to the macropterous form of the latter. It is to be hoped that this genus will be actively searched for and examined, as it is quite possible that all the forms described above may occur with us.

I have followed Kirby in the use of the name ACRYDIUM (Geoffr. 1762), which has undoubted right of priority over *Tetrix*, Latr. 1802 (usually written—as, indeed, by Sahlberg, Burr, and Lucas—*Tettix*).

NOTES ON LEPIDOPTERA FROM THE MEDITERRANEAN.

BY T. B. FLETCHER, R.N., F.E.S.

(Continued from p. 223.)

At Malta, during May, I had few opportunities for collecting, but came across the following species :—

Pyrameis cardui. Common.

Cænonympha pamphilus. Common, but worn.

Polyommatus astrarche and *P. icarus*. Common.

Pieris rapæ. Abundant; some of the females strongly suffused with black.—*P. brassicæ*. Common; a new brood.

Pontia daplidice. Moderately common.

Macroglossa stellatarum. Abundant.

Deilephila livornica and *D. euphorbiæ*. One specimen of each.

Heliothis armigera. One.

Erotyla trabealis (*sulphuralis*). One.

Anaitis plagiata. Fairly common.

Adela sp. One.

On the 22nd May we were suddenly hurried off on account of the mail troubles in Turkey, and arrived at Syra on the 24th. At this time of year the island was very bare and parched up, the only greenery apparently being in the orchards. I landed on the 25th, but a few *Thalpochares ostrina* *Pyrameis cardui*, and *Epinephele ianira* seemed to represent all the Lepidoptera on the wing.

The mail difficulties being settled, we left Syra on the 1st June, and, after looking in at Phalerum, found ourselves at Suda Bay, Crete, on June 2nd. The next afternoon I went in search of *Cænonympha thyrsis*, which is peculiar to Crete. A thunderstorm was brewing round the hill-tops, and the moist air was laden with the scent of the myrtle, wild thyme, sage, peppermint, &c., with which the hills were clothed; the butterflies were rather sluggish on the wing in consequence, and required to be knocked out of the bushes, from out of which also the big green lizards came rustling in a great state of mind. The following were the Lepidoptera met with :—

Danaüs chrysippus.—A specimen was flying round the ship in the morning, but I saw none ashore.

Hipparchia semele var. *aristæus*.—Common.

Epinephele ianira var. *hispulla*.—Abundant.

Cænonympha thyrsis.—Very common everywhere. Flits about over the bushes and herbage, keeping close to the ground; its habits seem precisely similar to those of our little *C. pamphilus*, which it seems to quite replace here.

Pararge egeria and *Satyrus megara*.—Common round a small group of plane- and fig-trees; the *egeria* were of course the South European form.

Lampides bœticus.—One tattered specimen.

Cyaniris argiolus.—A few males round the plane-trees.

Polyommatus icarus.—Males abundant, females not very common. There is one ab. *icarinus* amongst my captures, but several vary in the opposite direction, *i. e.* are increscent forms.

Spilothyrus alceæ var. *australis*.—Fairly common, especially in hollows at the foot of the hills.

Adopæa actæon.—Common. In the evening, when waiting in the dockyard for the boat, I took a nice little series settled on clumps of rushes.

Dysauxes punctata.—One specimen, inclining to subsp. *hyalina*, Freyer.

Ophiura bifasciata (*geometrica*).—One.

Thalpochares ostrina.—I only noticed one, but it was probably common.

Besides these there are several undetermined Geometrids and Pyralids, and a Sphingid which was hovering over flowers in the afternoon; from a glimpse I got of this last, I put it down as *Hippotion celerio*. Curiously enough, the ubiquitous *P. cardui* and *M. stellatarum* did not put in an appearance. Lepidoptera were by no means the only insects about, and a hymenopterist especially would have been in clover. One of the most striking insects observed was *Palpares libelluloides* (a Myrmeleonid); it has a wild, weak, flapping flight, but is wary when settled, and difficult to approach.

We left Suda Bay very early on June 3rd, and got to Malta next morning, coaled, and joined the Fleet the day after off the north coast of Sicily. On June 9th a specimen of *Manduca* (*Acherontia*) *atropos* was caught on board, and brought to me. Weighing all the probabilities, it appears to me that it flew on board the night before, during which we were not less than seventy miles from land; but, especially in these days of short passages, it is extremely difficult to assert positively that an insect has actually flown on board from any distance over the water, and has not previously come on board the ship—or another ship of the Fleet—on a previous occasion when in harbour; even when actually *seen* flying inboard apparently from the open sea, there is a possibility that it may have been on board before, and only be returning from a flight outboard in search of another place of refuge. In the case of birds which have flown on board, I have often seen them take a long flight outboard in search of land, and then return again to the ship as their only refuge; if not before noticed on board, we might readily credit this return to the ship as a first arrival. However, in the present case, *M. atropos* has well-known powers of flight.

(To be continued.)

FURTHER NOTES ON FORCING *AGROTIS ASHWORTHII*.

BY COLONEL PARTRIDGE.

THOUGH I have mainly to record a failure, the following notes may prove interesting:—

On March 26th last I received twenty half-grown larvæ, which were placed in a moderately warm greenhouse, and fed on hawthorn buds and leaves, which were then just obtainable. On April 10th they commenced to go down, and by the 16th all had disappeared. On the 19th the first imago appeared, and by the 24th nine had emerged, which a subsequent examination of the pot showed were all that had pupated.

On the 23rd I placed a male and female together, but, though very closely watched, I could not see that they paired; so, to make matters more sure, the next night I placed a fresh male in the cage. During the night of the 26th, 200 ova were deposited, the second night 103, the third night 35, the fourth night none, but on the fifth night a further 142, making a total of 480. Forty-eight hours after being deposited the ova turned light brown, with the exception of one egg, and this egg was the only one which failed to produce a larva. The larvæ were given knot-grass, to which they readily took, and were fed on it throughout, and thrived amazingly, with the exception of the 142 larvæ from the last-laid ova, which died almost immediately, apparently for the most part too weakly to make their first meal off the egg-shell. Losses occurred from time to time, but I believe in every instance the result of accident, being overlooked in changing the food, or escape from the pots; in no single instance did I find a dead body until the final catastrophe came. The larvæ had been kept throughout in large flower-pots piled against the hot-water pipes in the bath-room, and commenced to pupate on July 16th. About this time the great heat-wave set in, but a day or two's absence from home prevented my moving them to cooler and more roomy quarters, and in four days I lost the lot, with the exception of seven, which had already pupated, and which are now producing imagines. The disease which killed them seemed to be a fungoid growth which appeared on the anal segment in the shape of a small yellow spot, much like the commencement of a gathering. The anal segment then assumed a wrinkled look, as if the larva had cast its skin, and it remained sticking there. After this death was only a matter of an hour or two, when the larva was black, drawn out, and flaccid.

The main points of interest appear to me to be—1st. The wonderful fecundity of this species. 2nd. That by breeding from parents, themselves forced, I was able to obtain a second

brood two months earlier than Mr. Tait succeeded in doing from "wild" ova.

The time taken from egg to imago was exactly nine weeks, as Mr. Tait states in his notes.

72, St. John's Park, Blackheath : Aug. 5th, 1901.

DESCRIPTION OF A NEW SPECIES OF CICADIDÆ FROM
THE ISLAND OF HAINAN.

BY W. L. DISTANT.

Cosmopsaltria hainanensis, sp. n.

Head, pronotum, and tympana olivaceous; abdomen pale brownish. Head with a central spot at apex of front and the anterior angles of the vertex ochraceous; area of the ocelli pale castaneous, and with a small piceous spot at its base. Pronotum with a central pale longitudinal fascia, margined with pale castaneous; extreme posterior margin piceous, and two brown spots near each outer edge of the posterior marginal area. Mesonotum with two obscure obconical spots at anterior margin, outwardly and narrowly margined with black; an obscure marginal fascia on each side, and two central spots at base pale castaneous; cruciform elevation ochraceous, with a piceous spot near each anterior angle. Abdomen above ochraceously pilose, and with the posterior segmental margins ochraceous. Body beneath, legs, and opercula pale olivaceous; the anterior and intermediate tibiæ and tarsi piceous. Tegmina and wings pale hyaline, the venation ochraceous; tegmina with the costal membrane ochraceous with a central black line. Opercula reaching the apex of the abdomen, concave, and margined with black on each side near base, then convexly widened, their apices obtusely rounded. Long. excl. tegm. ♂ 48 millim. Exp. tegm. 106 millim.

Hab. Hainan—Five Finger Mountain (Whitehead, Brit. Mus.).

Allied to *C. feæ*, Dist., from which it principally differs by the longer opercula.

Since this description was written my own collection contains a second example, presented to me by Dr. Heath with some other insects from Hainan Island.

SOUTH AFRICAN COCCIDÆ.

By T. D. A. COCKERELL.

(Concluded from p. 227.)

Lophococcus mirabilis, n. sp.

♀. Adult very convex, 10 millim. long, 8 broad, and 7 high, exclusive of the dorsal spine; very strongly chitinated throughout, hard, tough but brittle, blackish brown, rugose and dull, with a thin coating of granular wax; on the middle of the back is a stout erect spine about 3 millim. long, like a spike on a military helmet; on each side is a pair of short stout spines in the subdorsal region, the posterior smaller and not amounting to more than a nodule; anterior end of insect somewhat elevated, with two more or less developed blunt and thick longitudinal keels; margin nodular; on the under surface the thoracic region is firmly attached to the bark, so that when the insect is taken off a piece of bark comes with it. Anal orifice large and very little posterior to the middle of the insect, as in *Crypticerya*.

Younger ♀. 8 millim. long, and not over 3 high (excluding spine); the protuberances of the adult all well-developed, the spine about as large; there is also a protuberance just in front of the spine; the anterior keels converge to a nodule in the middle line, forming a reversed V; and there are blunt lateral keels including the subdorsal protuberances, crenulate posterior to them. Margin with about fourteen tooth-like dull white protuberances on each side, these being really lamellæ of dense wax; from about the bases of these lamellæ come some very fine silvery threads.

Still younger forms have the dorsal spine arising as a transverse fold. The cast skins of the young forms are snow-white, much as in *Icerya*, with a fringe of waxy lamellæ. The legs and antennæ of the young are large and ferruginous.

The legs and antennæ seem to come to their full development in individuals little over 5 millim. long.

Antennæ 10-jointed, the joints after the third greatly bulging on one side, the sutures therefore very deep; last joint long and falciform. Measurement in μ :—(1) ?. (2) 90, (3) 90, (4) 60, (5) 60, (6) 70, (7) 70, (8) 75, (9) 75, (10) 216 to 294. Joints 2 and 3 are broader than long. Young examples have antennæ 8-jointed; club ordinary.

Legs well-developed, little hairy; tarsus half length of tibia; inner side of tibia with extremely short spines. Mouth-parts well-developed. Skin strongly chitinated, very densely beset with short hairs; the blunt hairs of some Monophlebids are represented by stout hairs with lanceolate heads; small round glands interspersed, not nearly so numerous as the hairs; there are also larger round or suboval brown spots, arranged more or less in rows. Below the mouth there are two large apertures in the chitinous surface, more or less connected in the middle line, and at the next suture beyond there is a large transverse aperture. Spiracles well-developed.

Hab. On branches of *Mimosa*, Verulam, Natal (Fuller, No. 9). Some of the adults show parasite-holes. This is per-

haps the most extraordinary coccid I ever saw ; it reminds one a little of *Icerya koebelei*, Maskell, but in that insect the erect process is of wax. It may be that the spine serves to prevent the birds from swallowing the insect, while its extreme toughness would make it hard to peck open.

Tachardia, Blanchard (Lac Insects).

This genus contains some very diverse elements, which will no doubt eventually be treated as genera. We may for the present recognize three subgenera :—

(1). *Tachardia* proper. Type, *T. lacca*, the East Indian commercial lac. Female very elongated, vasiform ; the individuals enclosed in masses of lac surrounding the twigs, never separate. I know of only one species of this group.

(2). *Tachardiella*, subg. nov.—Type, *T. cornuta*, Ckll. Female more or less globular ; individuals often separate. This includes the species of America and Australia.

(3). *Tachardina*, subg. nov.—Type, *T. albida*, with the characters given below.

Tachardia albida, n. sp.

Forming smooth yellowish-white masses on the twigs ; the extremely dense and hard lac of the several individuals running together ; masses up to 10 millim. diam., and 30 in length. The individuals are marked externally by orange patches, each presenting a small corrugated or segmented ridge, and an aperture. Cavities for females globular to subpyriform. Male scales of the usual elongated form, red, with a very short dorsal segmented ridge, about one-third of total length of scale.

♀. After boiling in liquor potassæ globular, giving a very fine crimson colour. Skin after boiling transparent, truncate and caudal processes remaining ferruginous. Mounted female on slide about 5 millim. diameter. Truncate processes (or "lac tubes") very short, orifices very small and numerous. Spine apparently absent. Caudal process peculiar ; transversely oblong or subreniform, with a deep posterior notch, on each side of which are two lobules ; lateral hind margins bearing a sharp spine ; surface finely reticulated ; anal ring hidden, only the ends of the numerous bristles projecting. Spiracles large and well-developed. Mouth-parts well-developed, but small, about 135 μ broad ; "lobes oraux" (as figured by Targioni-Tozzetti in *T. lacca*) very large.

Larva in female fusiform, narrow, tapering posteriorly, about 560 μ long and 240 broad ; caudal bristles very long.

Hab. On *Mimosa*, Verulam, Natal (Fuller, 5). A very peculiar species ; the first white lac I have seen.

Chionaspis retigera, n. sp.

Scales crowded on twigs ; white, the exuviae orange-brown. ♀. Scale mytiliform, about 1½ millim. long, straight or curved, very convex, the transverse growth-lines rather conspicuous ; second skin

more or less covered with white secretion. ♂. Scale of the usual shape, rather broad, with a barely indicated median keel; exuvia bright orange.

♀. Dark brown, subpyriform, or rather club-shaped, the anterior end being much narrowed; median lobes rounded, very low, rudimentary, but conspicuous because of their dark colour; two other lobes barely indicated by low rounded structures; spines ordinary; squames long and spine-like; anal orifice far from the hind end; five groups of circumgenital glands, the posterior laterals about 10, anterior laterals about 8, median 6; submarginal region with large reticulated patches, transversely elongate, making the five posterior segments, the last pair longitudinally elongate, and situated about the region of the lateral circumgenital glands; mouth-parts large.

♀. Second skin. Mouth-parts between the anus and the hind margin of the body; median lobes large, quadrate, separated by a rather wide interval; margin on each side of median lobes strongly serrate; squames long and spine-like. Some individuals of the third stage, presumably not quite mature, show also the large quadrate median lobes, with wavy-truncate ends.

Hab. Durban, Natal, on native shrub (Fuller, No. 18). Also found by Mr. Fuller at Verulam, Natal. *C. retigera*, as its name indicates, is peculiar for the net-work areas. *Mytilaspis defecta*, Maskell, has similar structures, and may be more closely allied than the different generic reference would suggest.

East Las Vegas, N.M., U.S.A.: May 11th, 1901.

NOTES AND OBSERVATIONS.

ON REARING LASIOCAMPA (BOMBYX) QUERCUS.—The subject of rearing hibernating larvæ has lately been attracting some attention, so my experience perhaps may be of interest. On August 15th, 1900, I had a female *L. (B.) quercus* brought to me, together with about forty eggs that she had laid. These hatched on September 9th and 10th. The young larvæ were supplied with bramble, so that they could be fed during the winter if they should need it. They ate fairly well, but grew very slowly, changing their skins for the first time between September 21st and 27th, and again in the middle of October; early in November they ceased feeding. During the winter I kept them on bramble twigs, which were stuck into pots of damp earth, covering the whole with a glass bell, open at the top. This I placed in the window of a room at the top of the house, where it could get no artificial heat, though, of course, the air inside the glass bell was warmer and moister than the normal atmosphere of the room. A large number died during the winter, especially towards the spring; the remainder, nineteen, began crawling about again at the end of February, and as the new leaves were not then out I had to feed them on the old ones, which three of them seemed too weak to eat, and died. The rest, however, commenced to feed fairly well, and moulted after

a few days. I then sprinkled the leaves with water, and in a few minutes nearly every larva was drinking greedily. During the next few days nearly all died, so that by April 1st there were only three left. These changed skin between April 1st and 5th, and grew quickly, changing again between April 21st and 27th, and again between May 20th and 26th. They fed up well, and grew to a much larger size than any I have had before. Towards the end of June they became restless, continually wandering about on the ground, and disappeared on June 26th, 27th and 30th. As the bottom of the cage was covered with dead leaves, I supposed that they had spun up in them, but when, a week later, I removed the leaves, I could find no trace of the larvæ. On turning over the soil I found the three cocoons, all close to the surface, and kept from actual contact with the soil by being surrounded each with a larger, very loosely woven cocoon, which came to pieces as soon as touched. The cocoons themselves were larger and blacker than any I have had before, and whereas all my others are smooth, these have the short close-set hairs of the larvæ, woven in in such a way that they stick out in all directions, and remain in the fingers when the cocoons are picked up. The first imago emerged on August 2nd, and the others on August 8th, all three being females. The chief points of interest seem to me to be the eager way in which the larvæ drank the drops of water, and the situation of the cocoons. As to the former, whether this was the direct cause or not of so many caterpillars dying, I cannot say, but probably the increase of moisture in the air, arising from watering the plants, had a good deal to do with it, as Mr. Frohawk suggests in the case of *Colias hyale* (*ante*, p. 169). More curious seems to be the situation of the cocoons. All I have had before have been made either on the sides of the cage or on twigs of the food-plant, and nowhere can I find mention of their being made underground. I should be glad to hear if any similar cases have been observed.—K. G. BLAIR; 23, West Hill, Highgate, N.

ABUNDANCE OF *CYANIRIS ARGIOLOUS* IN THE METROPOLITAN AREA.—We have always claimed *Cyaniris argiolus* as a Lewisham insect, as it has occurred annually in certain favoured spots hereabout as long back as my memory will carry me, but during the last two years it appears to have been increasing greatly in numbers, reaching its climax, in this respect, during the past few weeks. The spring brood was noted on the wing on May 27th, and the first individual of the summer emergence was seen on July 16th, from which date to the present the species has been on the wing whenever the sun has shone, flying over my little strip of garden, where there is certainly nothing to specially attract it, and about the roads in such numbers as I have never before seen it in the neighbourhood. Reports of a similar abundance reach me from other parts of the London suburbs, and it has been seen flying even in the streets of the City. There is little doubt that this great increase in numbers during the past two or three years is not confined to the London district, but is pretty general throughout the range of the species in this country (*vide* Entom., vol. xxxiii, pp. 14, 203, 226, 303, 351; vol. xxxiv, p. 16, &c.), nor has it been a sudden jump from a normal state of things to a great abundance, as is often the case, where immigration may play a leading part, but rather a

gradual increase during a series of years, the result, no doubt, of a succession of seasons that have been specially favourable to the development of the species.—ROBERT ADKIN; Lewisham, Aug. 5th, 1901.

ENTOMOLOGICAL FAUNA OF BERKSHIRE.—Will Lepidopterists, Coleopterists, Hymenopterists, or Hemipterists who have collected in Berkshire be kind enough to communicate, as early as possible, with W. HOLLAND, or A. H. HAMM; University Museum, Oxford.

BUFF-COLOURED AMPHIDASYS BETULARIA.—I am much obliged to Mr. Pierce and Mr. Mason, and also to Mr. South, that they should have taken sufficient interest in my note on the buff form of *Amphidasys betularia* to write the interesting notes they have written on the subject. I may say, however, that if these buff specimens were produced artificially by chemical means, and were not productions of nature, that fact rather detracts from their interest to me than otherwise. Referring to Mr. South's remarks, in the current number of the 'Entomologist' (xxxiv. 228), as to the coloration of the antennæ, I have examined my specimen, which is a female, and I find that the usual black portions are inconspicuous, and distinctly of a buff colour, though perhaps hardly so pale as the coloration of the wings.—H. AINSLIE HILL.

INSECTS OF MALTA.—I should be much obliged to any reader of the 'Entomologist' who can refer me to any published information on the insects, especially the Lepidoptera, of Malta. The only information I can find is comprised in Messrs. G. F. Matthew's and P. de la Garde's lists in Entom. vols. xxxi. and xxxii. and a few brief notes in Prof. Leith Adams' book 'Notes of a Naturalist in the Nile Valley and Maltese Islands.' Will anyone who can help in the matter kindly communicate with me direct, as I am desirous of making as complete a list as possible?—T. B. FLETCHER; H.M.S. 'Gladiator,' Malta, August 16th, 1901.

CAPTURES AND FIELD REPORTS.

PIERIS DAPLIDICE AT DOVER.—On the 11th inst., while collecting with my friend Mr. Wood, of Ashford, I had the good fortune to take two very good specimens of this rare insect. Both are unfortunately chipped in the left hind wing, otherwise they are in good condition. This is the first time I have taken *P. daplidice*, and I thought when I saw the first one flying that it was an old specimen of *Melanargia galatea*, but on closer observation it turned out to be a surprise in the shape of a "Bath white." This led to further search, and I was rewarded with the capture of another specimen. There is no mistaking *daplidice* for the other "whites" when on the wing, as their flight is heavier, and they seem to keep closer to the flowers, and do not fly any distance before settling. I should mention that both these specimens are now in the collection of Mr. Sabine.—H. DOUGLAS STOCKWELL; 2, Albert Road, Dover, August 15th, 1901.

PIERIS DAPLIDICE, COLIAS EDUSA, AND C. HYALE AT EASTBOURNE.—While collecting on the Downs near Eastbourne this morning I had

the good fortune to capture a large though somewhat battered example of *Pieris daplidice*. I also took a couple of beautifully fresh *Colias hyale*, and saw but failed to capture *C. edusa*, all on a path of rough down less than a couple of hundred yards square.—ROBERT ADKIN; August 19th, 1901.

COLIAS HYALE NEAR MALDON.—This afternoon I took a male *C. hyale* in a lucerne field within a stone's-throw of my house, and in exactly the same part of the field where I took my first specimen on Aug. 11th last year. Clover and lucerne have done better this year than last, and were nearly all cut (second crop) three weeks ago, so that I hardly anticipate an abundance of *Colias* round here this year.—(Rev.) GILBERT H. RAYNOR; Hazeleigh Rectory, Maldon, Essex, August 16, 1901.

COLIAS HYALE IN ESSEX. — *C. hyale* has again put in an appearance here in some numbers this year. My boys captured ten specimens yesterday morning, and fifteen more this morning. I went down to a field of lucerne in full bloom and soon caught six, two being white females. The eggs I had last year (Entom. xxxiii. 274) hatched, but the young larvæ, which were left outdoors on white clover, were all winter-killed. It does not seem that *C. hyale* will stand our climate without some protection through the winter. We have not seen *C. edusa* at present.—EDWARD A. FITCH; Maldon, August 17, 1901.

COLIAS HYALE IN KENT, 1901.—*Colias hyale* I had not taken again after the specimen recorded (*ante*, p. 208) as taken on June 14th until 9th inst., when I saw and took one; since then, on 19th, I saw two and took one, on 20th the same, and on 21st I saw five and took two; to-day I have seen eleven and taken nine. It therefore seems as though this, though in a minor degree compared with last year, is going to be a "*hyale* year."—H. HUGGINS, Jun.; 13, Clarence Place, Gravesend, August 22nd, 1901.

VANESSA POLYCHLOROS AND ARGYNNIS PAPHIA AT WITHERSLACK.—While collecting at Witherslack, Westmoreland, I captured a male *V. polychloros* in splendid condition on July 24th. Mr. George Loxam, who was with me at the time (in fact he saw it first, and drew my attention to it as it came towards me on the wing), tells me he has never heard of this species being taken in that neighbourhood before, although he has collected in company with the late J. B. Hodgkinson about Witherslack for the past thirty years. On August 3rd I took a male specimen, in fine condition, of *A. paphia*; this also is, I believe, a record for Witherslack.—C. H. FORSYTHE; County Asylum, Lancaster, August 9th, 1901.

NOTE ON VANESSA POLYCHLOROS AT LEE.—A specimen of *V. polychloros* was discovered on the landing wall. It remained in the same position for a week (being rather high up, I took it for *V. urticae*), and on July 27th I examined it. It was somewhat battered, and looked like a hibernated specimen, but I suppose it would be too late for that. Directly I put it in the sun it flew away. The locality may be of interest, as I see from Mr. Prout's 'Fauna of the London District' that Dulwich and Croydon are the only two S.E. localities given.—F. M. B. CARR; 46, Handen Road, Lee, S.E., July 29, 1901.

VANESSA ANTIOPA IN SOUTH-EAST LONDON.—We captured this afternoon in our garden here a fine specimen (barring a slight nick in one of the hind wings) of *Vanessa antiopa*. The insect was taken by my children on a fruit tree we had been in the habit of sugaring for moths.—GEORGE B. BROWNE; 43, Southbrook Road, Lee, S.E., August 24th, 1901.

LYCÆNA MINIMA (POLYOMMATUS ALSUS) IN AUGUST.—I caught this afternoon (August 5th) a quite perfect specimen of *P. alsus*. Can this be a late specimen of the early brood? or is there a second generation in August? The butterfly was very common here in June, and I expect the very hot weather we have had has brought out a second generation. I should like to know if others have noticed this.—L. M. SETH-SMITH; Alleyne, Caterham Valley, Surrey, August 5, 1901.

[Probably an individual of a partial second brood. Kane (Eur. Butt.) states that *L. minima* is double-brooded on the Continent, the imago appearing in May to June and July to August.—ED.]

ABUNDANCE OF LYCÆNA ARGOLUS AT LEE.—Although *L. argiolus* was seen abundantly in the country last year, I did not find it common here. This year, however, it has been very abundant. The first one was seen on May 2nd, and twelve days later I counted nine in twenty minutes in Burnt Ash Road. I saw the last of the spring brood on June 9th. Two specimens of the later brood were seen on July 24th, and since then it has been common here.—F. M. B. CARR; 46, Handen Road, Lee, S.E., July 29, 1901.

PURPLE LARVA OF SPHINX LIGUSTRI.—On August 10th I had a beautiful larva of this species exactly similar to the variety found by Dr. Laver at Colchester in September, 1882, and figured in Buckler's 'Larvæ of the British Butterflies and Moths,' vol. ii. pl. xxii. fig. 2. It was full-fed, and found in a potato-patch at Goldhanger, near here; it did not feed, and went under the same afternoon. Once before I had a purple larva brought me that was more purple than green, but not so dark and distinct as this one.—EDWARD A. FITCH; Maldon, Essex, August 17, 1901.

LARVÆ OF SPHINX CONVULVULI AT MALDON.—Having bred most of the hawks, I was pleased to get two larvæ, nearly full-fed, of this moth on August 14th. They were found by one of my men in a potato-field where *Convolvulus arvensis* is abundant. One is exactly similar to Buckler's figures; the other is green, with a canary-coloured horn—a very pretty variety. I had this larva once before, but did not breed the moth. I hope now to be more successful. Barrett ('Lepidoptera of the British Islands,' vol. ii. p. 27) says "it is doubtful whether there are records of the finding of twenty larvæ, in all, in these islands."—EDWARD A. FITCH; Maldon, Essex, August 17, 1901.

SPHINX CONVULVULI LARVÆ IN LANCASHIRE.—On August 19th my brother and I took on the Lancashire coast sand-hills twenty-six larvæ of *S. convulvuli*. They were feeding on wild convulvulus or bindweed, and varied in length from $2\frac{1}{2}$ in. to $3\frac{1}{2}$ in. One of them is of a brownish colour and another black. In the largest examples the black stripes on the sides are almost absent. As Newman ('British Butterflies and Moths') states that he had never seen the larvæ or pupæ, I thought

therefore that this record was perhaps worth sending.—F. J. GRIMSHAW ; Carr House, Rawtenstall, Lanes, August 21, 1901.

SPHINX CONVULVULI IN ESSEX.—We caught an example of *S. convulvuli* at tobacco bloom last evening, and this evening we captured two fine specimens. Each evening we missed one.—E. A. FITCH ; Maldon, Essex, Aug. 19th, 1901.

SPHINX CONVULVULI IN SUSSEX.—I have received a fine specimen of *Sphinx convulvuli*, taken by Mr. Pullen in a cornfield at Eartham, Sussex, on August 16th.—L. S. GILES ; 1, London Road, Norbury, S.W., August 25th, 1901.

ACRONYCTA ALNI IN WARWICKSHIRE.—I found a very fine larva of this species on August 12th feeding on oak. It has now spun up in a hollow stalk of broad bean.—W. KISS ; Greenfield House, Dorridge, near Birmingham.

PLUSIA MONETA AT BICKLEY, KENT.—I have to record the capture of yet another specimen, taken off a fence on July 27th, and brought to me in very fine condition. This species appears to be fairly abundant this year between here and Tunbridge Wells, this being the third to enrich my cabinet during the present month.—A. J. LAWRENCE ; Bromley Common, Kent, July 29, 1901.

PLUSIA MONETA AT READING.—On July 13th my son Douglas Harry Butler, four years of age, boxed a specimen of the above in my back garden ; it was at rest on an ivy-leaf.—W. E. BUTLER ; Hayling House, Oxford Road, Reading.

CALLIMORPHA HERA IN ENGLAND.—On August 7th, Mr. W. W. Rhoades, of Honiton Clyst, captured one specimen of *C. hera* within five miles of Exeter, and saw another which he failed to take. This moth has been occasionally taken in other seasons near Exeter, and, it is to be hoped, has fairly established itself in the locality. — (Rev.) W. J. LEIGH PHILLIPS ; The Cottage, Tavistock, August 18, 1901.

SESIA ANDRENIFORMIS IN KENT.—Whilst my son and I were out near here on July 17th, the latter took a clear wing which turns out to be the rarest of the British *Sesiæ*—viz. *S. andreniformis*. It was settled on a leaf of the wild cornel or dogwood, *Cornus sanguinea*. I should have recorded it sooner, but was loth to believe in our good luck, though the insect corresponded perfectly with the description given in Newman's 'British Moths,' but having now had the opportunity of submitting the same to my friend the Rev. C. R. N. Burrows, the latter says there is not the least doubt as to the identity of the insect.—H. HUGGINS, Jun. ; 13, Clarence Place, Gravesend, August 22nd, 1901.

LARVÆ OF NYSSIA LAPPONARIA.—I think many of your readers will be interested to hear that last year I took two larvæ of *Nyssia lapponaria* from which one imago, a female, emerged. Last July I again obtained larvæ in the same locality in Perthshire. I believe Mr. Christy is the only other entomologist who has taken this insect recently in Britain. According to Barrett, he found his larvæ on hawthorn and birch, whereas mine were feeding on low plants—ling,

bell-heather, and bog-myrtle.—E. A. COCKAYNE; 6, Tapton House Road, Sheffield, Aug. 22nd, 1901.

LUCANUS CERVUS IN LONDON.—On July 24th a fine male *L. cervus* was given to me. It had been found in an area of our street. Is not this rather an unusual insect to occur in such a part of London (Pimlico)?—N. L. GILLESPIE; 8, Ranelagh Grove, S.W., August 10.

[This species has been fairly common at Balham this year.—ED.]

GYMNUSA BREVICOLLIS IN YORKSHIRE.—I captured a specimen of this beetle under a stone in a stream near Staithes on June 14th.—N. L. GILLESPIE; 8, Ranelagh Grove, S.W., August 10, 1901.

NOTE ON RHIZOTROGUS SOLSTITIALIS.—This beetle was very abundant here about midsummer. We could have caught scores almost any evening as they buzzed round the fruit trees in the garden. It would be interesting to know whether this insect was observed in such numbers in other localities.—PHILIP J. BARRAUD; Bushey Heath, Herts, August, 1901.

GERRIS COSTÆ (*H.-Sch.*) AT DEAL.—I was surprised to find this, as the species is, as a rule, alpine and subalpine both here and on the Continent.—G. W. KIRKALDY.

SIREX GIGAS.—I caught a specimen of *Sirex gigas* here on the morning of August 1st. Can you in any way account for the occurrence of this insect? — THOS. B. BLAKEBOROUGH; Ashlea, Brighouse; August 14, 1901.

[The larva of this species lives in the solid wood of fir trees, usually unhealthy ones. Eggs, however, have been known to be deposited in sound trees that have been recently cut down. The occurrence of the perfect insect in places where there are no firs is most probably due to its having been introduced, in one of its earlier stages, with the timber used in house-building, &c.—ED.]

NOTES FROM THE CHESTER DISTRICT. — This has been a record year with us for the handsome geometer *Anticlea derivata*. An old, disused and neglected country road—grass-grown, and neglected even by the insect-hunter, and with plenty of dog-rose and sallow on either side—turned out to be a regular home for the pretty moth. *Hypsipetes impluviata* and *Cidaria suffumata* were equally common in this lane, along which tradition says William III. marched his army to Parkgate previous to the battle of the Boyne, in 1690. Now, it is as silent and lonely as a place can well be. All traffic diverted, and entirely neglected, except where absorbed here and there by adjacent fields, a locality like this can only be worked in dry weather, and we had the advantage of an almost rainless May when the three species were on the wing. Among the early Noctuas *Pachnobia rubricosa* and *Tanioscampa pulverulenta* (*cruda*) were especially noticeable in the district. Day-work in June and July was chiefly devoted to two objects—(1) to find, if possible, the pupa-case of the dragonfly *Leucorrhinia dubia*, and (2) to see in how many Delamere Forest localities the butterfly *Cænonympha typhon* (*davus*) still lingered. In the first we were disappointed. No amount of searching, even on hands and knees, in the most horrible sponges and morasses, could unravel the mystery. Only one clue did I discover which may possibly lead to the situation.

One day I netted a specimen of *L. dubia* which had its left lower wing rather crippled. This wing was *crusted* with the black, peaty mud of the pools about. The pupa-case, then, is probably always in the water. In the second of our ambitions we got on "gradely," as they say in Lancashire. We found no less than four *davus* localities—and far be it from me to say where they are—nay, far be it from me to say more than that the numbers of the butterfly were satisfactory. There ought to be five localities, but from the fifth *davus* has long since been removed by over-collecting. Any indication of a similar process on the remaining spots will probably result in a curtain between *davus* and the public, and so history will repeat itself. For *davus*—at any rate the Delamere form—is a handsome insect, and variable. To the entomologist who has a weakness for "spots" and "under sides" it is unique. These eye-like markings vary from the size of a pin's head to about a quarter of an inch across. As to shape, they are usually circular; but there is a form which has them oval, and there is another where the spots are acutely pointed towards the wing-margins, and remind one, in shape, of ears of oats or barley. Again, the ground-colour of the under sides is sometimes *white*, and the large, basal, brown area of the secondaries is divided into what look like a couple of deeply-indented leaves. Still, the upper surface is frequently so handsome and so well spotted that it is often puzzling which side to show. If the upper surface be dark, the spots numerous and large, and the lower wings almost black—a fine but infrequent form—then there can be no doubt about the matter. *Lycæna ægon* has been, on certain Delamere heaths, in even greater numbers than last year. We did not take one. But the splendid *Nemeophila russula*—aglow with yellow and crimson—did not get off so easily, even in the tropical heat, when we could catch it, which was not always. At the electric lamps there has been a marked falling-off in the numbers of certain species—for examples, *Amphidasys betularia* (I took a fine intermediate form on the night of June 1st), *Notodonta dictæa*, *N. dictæoides*, *Xylophasia monoglypha* (*polyodon*), *Smerinthus ocellatus*, and *S. populi*. On the other hand, I have to report three species new to the lamps, as far as I know—*A. strataria* (*prodromaria*), one, April 18th; *A. derivata*, one, May 14th; and *Abraxas ulmata*, one, July 3rd. Other occasional visitors were—*Drepana binaria* (*hamula*), one, July 8th; *Leucoma salicis*, one, July 17th; and *Zeuzera pyrina* (*æsculi*), about a dozen in July. The first brood of *Plusia festucae* appeared early in May, the second on July 20th. The hot, sometimes tropical, weather from June 20th to July 21st was no doubt responsible for the early appearance of the second brood.—J. ARKLE; Chester.

ODONATA AND LEPIDOPTERA AT LLANDRINDOD (RADNORSHIRE).—Mr. J. Lyon Denson, of Chester, whilst staying at Llandrindod Wells in the first half of June, kindly sent me the following species which he captured there. ODONATA: *Calopteryx virgo*, sixteen males, four females. LEPIDOPTERA: *Pieris brassicæ*, *P. rapæ*, *Euchloë cardamines*, ten *Argynnis euphrosyne*, *Pararge megæra*, *Cænonympha pamphilus*, five *Hesperia sylvanus*, *Phytometra viridaria* (*ænea*), and a larva of *Vanessa polychloros* which spun up, but unfortunately emerged a cripple. The fine weather for insect-hunting broke up on the 12th, and people had to take to overcoats again for a week.—J. ARKLE; Chester.

NOTES ON LEPIDOPTERA DURING JULY AND AUGUST, 1901. — Last month (*ante*, p. 228) I referred to the early appearance of many insects this year. Since then imagines of *Smerinthus populi* and *S. ocellatus* have emerged, the data of which are as follows:—*S. populi*, larvæ from ova June 4th, pupated July 3rd; imago appeared July 25th, at 7 p.m. I looked at them for the first time, and found a male and female *in coitu*; I kept the female alive, and by the 30th she had laid 125 ova. The second brood of larvæ appeared on Aug. 5th, and at the time of writing are in a flourishing condition. *S. ocellatus*, larvæ from ova June 5th, pupated July 12th; imago appeared Aug. 9th. I had only bred half a dozen of these, and curiously enough all the moths were females, so I have not succeeded in getting a second brood. *S. tiliæ* and *Sphinx ligustri* also are much in advance as compared with last year, for *tiliæ* pupated July 7th, though the imagines have not yet appeared; and *ligustri* pupated on July 17th. The dates last year for the pupating of the four above-mentioned insects were:—*S. populi* and *S. ocellatus*, July 30th; *S. tiliæ*, July 27th; *S. ligustri*, Aug. 30th. At 6.45 p.m., on July 5th, I observed *Macroglossa stellatarum* hovering over a flower in my garden. It was completely in the shade, and stayed there several minutes, never once settling all the time. On July 7th, when I first saw my breeding cage at 7 a.m., I found that four imagines of *Catocala nupta* had emerged; but even at that early hour they had had time to knock themselves about, for a little piece was out of the wings in each one. The rest of the imagines came out at intervals from the above date till July 17th, never again more than two together, and all these were perfect specimens. The larvæ had emerged on April 27th, and they begun to pupate, some in moss and others between two leaves of their food-plant, willow, on June 4th. On July 8th the first pupæ appeared from my batch of *Nemeobius lucina*. On July 10th we had a good day on Ranmore Common, where *Argynnis adippe* and *A. aglaia* were out in great numbers; but they were very wild and difficult to catch, as the going was bad among the gorse and bramble-bushes. A friend of mine, who takes a great interest in entomology, though he does not collect, told me that on the afternoon of July 12th, while he was walking in Horning churchyard, in Norfolk, he observed a very fine specimen of *Papilio machaon* on a sweet-william blossom. He got quite close to it, and could have caught it easily if he had had a net with him. After some time it left the flower, and, hovering in a circle for a few moments, alighted again on the same place; but in about ten seconds it flew right away high up in the air, and he did not see it again. On July 13th a batch of larvæ appeared from ova of *Sphinx pinastri*, which I obtained from abroad. They did very well until Aug. 11th, when for some reason or other they all died. Most of them had successfully passed the fourth moult, and were eating at a great rate; but they suddenly ceased feeding and shrivelled up. On the same date I found a great number of larvæ of *Euchelia jacobææ* feeding on ragwort, and for the next ten days or so I kept finding them. They had all pupated by the end of the month. On July 16th I obtained a good number of *Hesperia comma* on Ranmore. I knew they must be about in our neighbourhood, but had never found them before. The same remark applies to *Lycæna corydon*, for in former years I had always succeeded in getting

one or two specimens, but had never found their haunt. This year, however, on July 20th, I came upon it not two hundred yards from where I had been searching before. They were in the utmost profusion on the side of a chalk-hill, and very pretty the males looked as the sun caught the sheen of their wings. A second brood of *L. argiolus* was also out on that date, and *Satyrus semele* appeared plentifully. On July 19th the first imago of my *Ennomos fuscantaria* appeared, and they are still coming out at intervals. In a field near Coldharbour, on Aug. 7th, a friend of mine took a fine male of *Colias hyale*, but I have not been able to go there since.

I am now staying near Lynton, in North Devon, and have only had one day's entomology—Aug. 19th—when I took my net along the Lyn Valley for about five miles. *Argynnis paphia* was very common and easy to catch, but, except for one fresh female, all were in bad condition. *A. adippe* was to be seen, too, also in poor condition. Any number of *Pararge egerides* could be taken among the trees and woodland paths, and such things as *L. icarus*, *Polyommatus phlæas*, *Epinephele ianira*, and *E. tithonus* were absolutely swarming. I took two fine specimens of *Vanessa io*, and one *V. polychloros*. *A. paphia* showed a great liking for the bramble-bushes, and also for thistles, from which latter it could easily be taken. But my trip to Devonshire is more for health's sake than for entomology, and so my notes for August are, I fear, somewhat scanty.—F. A. OLDAKER; Parsonage House, Dorking, Aug. 20th, 1901.

SOCIETIES.

SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—*July 11th, 1901.*—Mr. W. J. Lucas, B.A., Vice-President, in the chair.—Mr. Kemp exhibited a short series of the Coleopteron *Dytiscus punctulatus*, taken by Mr. F. Enock at Wisley, together with the Odonata, *Brachytron pratense*, *Calopteryx splendens*, *Erythromma najas*, *Agrion pulchellum*, *Ischnura elegans*, with var. *rubra*; the Trichoptera, *Phryganea grandis*, *Limnophilus marmoratus*, and *L. rhombicus*; and the Neuropteron, *Raphidia maculicollis*, all taken at the Byfleet Field Meeting.—Mr. F. M. B. Carr, a series of *Thecla rubi* from Wrotham, Kent, including a specimen with a cream spot on the fore wings.—Mr. South, a series of *Zonosoma porata*, bred from a female taken at Oxshott, and called attention to the unusual brown coloration of some of the specimens; also an example of *Eurrhynx urticata* with confluent spots, taken by a boy in Ballham. On behalf of Mr. Mitford he showed three varieties of *Melitæ cinxia* (1) having transverse lines of fore wings absent, (2) central transverse lines partially effaced, (3) central spots of fore wings confluent.—Mr. Montgomery, pupæ of *Leucophasia sinapis*, one specimen having the longitudinal line pink instead of white.—Mr. Bishop, living larvæ of *Eugonia polychloros*, and pupæ of *Euchloë cardamines*.—Mr. Kirkaldy, various genera of *Fulgorinæ* (lantern flies), showing the remarkable development of the head; a number of ornate species of Rhynchota, including the pale blue *Hansenia pulverulenta*, the pale green *Geisha punctatissima*, the delicate rose *Cerynia maria*, and a number of coffee pests from Ceylon.

—Mr. Colthrup, two striking vars. of *Smerinthus tilia*: (1) ground colour pale fawn on fore wings with indistinct markings, pinkish tint on hind wing; (2) ground of fore wing dark brown with very intense green markings, the band represented by a small spot only.—Mr. Lucas read the Report of the Field Meeting held at Byfleet on June 1st.—Mr. Clark read a few notes on a "Walk in his Garden," and showed various specimens, including a grasshopper which had not been identified, and was probably new.

RECENT LITERATURE.

Familiar Butterflies and Moths. By W. F. KIRBY, F.L.S., F.E.S., &c.
 $9\frac{1}{4} \times 7\frac{1}{2}$ in. Pp. i-xiii and 1-114, with 18 coloured plates.
 London: Cassell & Co. 1901.

As an introduction to the larger work, 'European Butterflies and Moths,' by the same author, the present volume should be useful. It deals in a popular style with the subject, and illustrations are given of many of the well-known British species, and of some others that are not inhabitants of these islands. The English name of the species is used in every case, but the Latin names are added in brackets, and these are the same as those employed in the larger work referred to. The plates are, on the whole, very good, and some of the figures are excellent; the printing and general get-up are all that could be desired, and to young people with a bent for collecting moths and butterflies the book should be very acceptable.

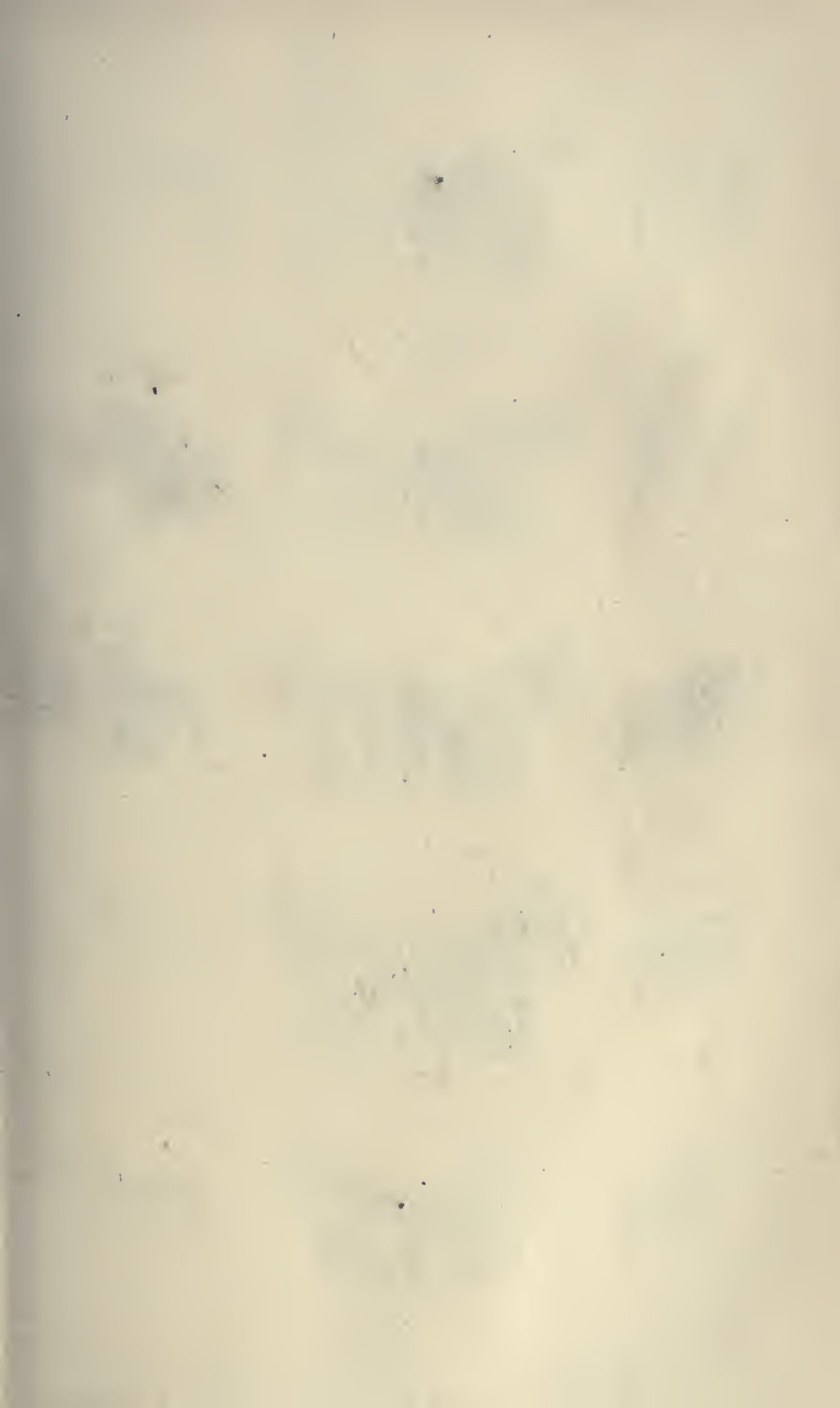
Proceedings of the South London Entomological and Natural History Society for 1900. Together with the President's Address. Pp. i-xxvi and 1-117. A chart and four plates. Hibernia Chambers, London Bridge, S.E.

FULL reports of the five Field Meetings held during the year are given; that of the Banstead excursion on June 16th is accompanied by a capital sketch map, prepared by Mr. B. W. Adkin, which should be useful to anyone wishing to further explore this rural locality.

Among the entomological papers is one "On the Pupation of *Cossus ligniperda*," by Mr. Robert Adkin, in which the method of pupation is very fully discussed. Another interesting paper is by Mr. F. Noad Clark, and entitled "On the Ova of Lepidoptera." This is illustrated by an excellent plate, reproduced from some beautiful photographs taken by the author. Dr. Chapman's contribution, "On Some Wing Structures in Lepidoptera," is a valuable and highly instructive paper; it is illustrated by two plates of details photographed by Mr. Clark.

The President (Mr. W. J. Lucas), in his Address, enters largely into matters connected with the Odonata, and among other things he deals with the growth of our knowledge as regards the earlier stages of these very interesting insects.

Taken as a whole, the volume for 1900 is much ahead of any of this Society's previous publications, although it is less bulky than some of them.





F.C. Knight del.

West, Newman chromo.

Varieties of Irish Lepidoptera

EXPLANATION OF PLATE IV.

FIGS.

1 & 2.	<i>Cymatophora duplaris</i> var. <i>argentea</i> , Tutt.	. Entom. xxvii. 126
3.	<i>Dianthæcia capsophila</i> var.	. . . „ xxix. 19
4.	<i>Bryophila muralis</i> var. <i>impar</i> , Warr.	. „ xxvii. 209
5.	„ „ „	. „ xxvii. 209
6.	<i>Pieris napi</i> var. <i>flava</i> , Kane	. . . „ xxvi. 119
7.	<i>Melitæa artemis</i> , Fabr.	
8.	„ <i>aurinia</i> var. <i>præclara</i> , Kane	. . . „ xxvi. 159
9.	„ „ var. <i>scotica</i> , Robson	. . . „ xxvi. 187
10.	<i>Cymatophora or</i> var. <i>gaëlica</i> , Kane	. . . „ xxvii. 125
11.	<i>Xylocampa areola</i> var.	. . . „ xxix. 160
12.	<i>Camptogramma bilineata</i> var. <i>isolata</i> , Kane	. „ xxxi. 85
13.	„ „ var. <i>infuscata</i> , Kane	„ xxxi. 85
14.	<i>Platyptilia tesseradactyla</i> , Linn., ♂	. . . „ xxxi. 209
15.	„ „ ♀	. . . „ xxxi. 209

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[No. 461.

ABERRATION OF *GONOPTERYX RHAMNI*.

By W. J. LUCAS, B.A., F.E.S.



ON July 29th, 1901, Mr. G. Hooker took, near Lyndhurst, in the New Forest, a rather strange aberration of *G. rhamni*, ♂. Between the nervures and in the discoidal area were large oval rings of very pale brownish orange, the colour inside being a very pale green. This is on the under surface; the markings scarcely shew through to the upper. The specimen was taken quite by chance, for the rings are so pale that they would not be noticeable when the insect was flying. The figure will shew the size and position of the rings. In other respects the insect is normal.

Kingston-on-Thames.

DESCRIPTION OF A NEW GENUS OF BEES FROM INDIA.

By PETER CAMERON.

AGLAOAPIS, gen. nov.

Wings short, not reaching to the apex of the third abdominal segment. There are two closed cubital cellules; the first is longer than the second above and below; the radial cellule has the apex rounded and not much narrowed; the first recurrent nervure is interstitial; the second is received not far from the apex of the cellule. Eyes large, slightly converging below, and reaching to the base of the mandibles; the ocelli are in a curve. Labrum visible, short, obliquely depressed. Mandibles bidentate; the apical tooth is much larger than the other. Scutellum bluntly projecting laterally at the apex; the middle slightly projects, and is keeled; the post-scutellum is keeled in the middle. Median segment short; the basal area large. Legs short and stout, pilose; the tibiæ and tarsi not densely covered with long hair. The basal segment of the abdomen is transverse at the base, and is bordered at the base by a distinct keel; the apical segment is longer than the penultimate, and is distinctly incised at the apex; the sides of the incision are straight and oblique, and form two distinct lobes, which become gradually narrowed from the base to the apex; the lower edge is stoutly keeled. The antennæ are short and stout; the third joint is not much narrowed; the head is well-developed behind the eyes, with the occiput transverse; the apex of the scutellum does not project over the post-scutellum, and only over the median segment at the sides; the claws and spurs are simple; the tegulæ are large; the head and thorax are thickly covered with short white pubescence; the abdominal segments are narrowly banded at the apex with white pubescence. There is no ventral scopa. The front calcaria are normally curved; the claws simple.

Belongs, if anywhere, to the Stelididæ, and comes nearest perhaps to *Parevaspis*, which may be known from it by the projecting apex of the scutellum, which is incised at the apex; by the second recurrent nervure being received beyond the second transverse cubital nervure, and not in the second cubital cellule; by the apex of the abdomen not being deeply incised in the middle in the female; and by the longer wings. The wings in the present genus are shorter than usual. It is easily known by the form of the scutellum, by the transversely keeled basal segment of the abdomen, and by the deep incision in the apical segment. The colour—black, with the basal two or three segments of the abdomen red—is peculiar, and does not occur with any other Indian species. The genus is doubtless, like *Stelis* and *Parevaspis*, a parasitic one.

AGLAOAPIS BREVIPENNIS, sp. nov.

Black, thickly covered with white pubescence; the apices of the abdominal segments banded with white pubescence; the greater part

of the first and the whole of the second segment, and sometimes the third, red; the wings hyaline, the stigma and nervures black. Female. Long. 6-7 mm.

Hab. Bombay (G. A. J. Rothney).

Antennæ black, the flagellum with a faint brownish tint; bare, the scape covered with white hair. Front and vertex strongly and closely punctured; the front, the sides of the face, and of the clypeus thickly covered with white pubescence; the central parts and the vertex much more sparsely covered with similar pubescence. Mandibles black, rufous near the apex; the base punctured, and covered with white pubescence; the middle above hollowed. Mesonotum and scutellum closely rugosely punctured, and covered with white pubescence, which is thicker and more fulvous in tint round the eyes; the post-scutellum is thickly covered with white longish pubescence. The base of the median segment is stoutly longitudinally striated; its apical slope laterally is covered thickly with white pubescence. Pleuræ thickly covered with white pubescence. Legs black, thickly covered with white pubescence; the calcaria testaceous. Abdomen closely and distinctly punctured; the punctuation on the basal two segments is stronger and more widely separated than it is on the others.

BUTTERFLY COLLECTING IN AUSTRO-HUNGARY IN 1900.

BY HENRY C. LANG, M.D., F.E.S.

THE following notes are a record of butterfly collecting in Austria and Hungary during one month of the summer of 1900, from June 21st to July 21st. The dates and localities were as follows:—Salzburg, June 21st to 28th; Berchtesgaden, June 26th to 28th; Modling, near Vienna, June 29th to July 2nd; Buda Pesth, July 3rd to 9th; Herculesbad, July 12th to 20th; Orsowa, July 20th.

At Salzburg there were very few butterflies on the low ground; almost everything was collected on the wooded hills a few miles east of the town.

At Berchtesgaden, in Bavaria, but a few miles from Salzburg, there is a fine opportunity for mountain collecting, but unfortunately the weather was dull or rainy, with the exception of one day—June 27th—when I collected in the woods above the village.

At Modling, near Vienna, the weather was fine, but some of the best species found there were not yet on the wing (one *Neptis lucilla* was taken).

At Buda Pesth we had very unfavourable weather; the days were mostly showery, and at times windy and cold. Collecting was mostly on the Schwabenberg, a mountain reached by rack-and-pinion railway from the town. It is an interesting locality, covered with woods of oak and beech, and with open grassy slopes.

Herculesbad is situated in a deep river valley at the extreme south-east corner of Hungary, surrounded by densely wooded heights of a considerable elevation. From the summits of these one gets an extensive view of immense forests stretching out as far as the eye can reach into Roumania and Servia. The trees are principally beech, many of them being of gigantic stature, and the country is wild in the extreme. The valley of the Czerna, in which Herculesbad is situated, resembles somewhat the dales of Derbyshire on a larger scale, the river running rapidly between limestone crags. In this valley *Neptis aceris* was very abundant, and was a very interesting object on account of its exceedingly graceful flight. I have seen it flying in front of the cafés and the casino garden, as well as in the wild places in the neighbourhood. *Neptis lucilla*, as well as *Limenitis sibylla* and *L. camilla*, are also to be taken in this locality. On the woods, on the steep hill-sides, *Pararge roxelana* and *P. climene* are sometimes abundant, and on the high ground *Erebia melas*. In this valley I took what is undoubtedly *Lycæna zephyrus*. I do not think this species has been previously recorded from Hungary. *Argynnis paphia* is very large and brightly coloured. The commonest butterfly is probably *Melanargia galatea* var. *procida*. *Thanaos tages* var. *cervantes* is common on the banks of the river. On the Damogled, a height on the eastern bank, *Erebia æthiops* var. *leucotenaria* was common, and on one occasion I took what I believe to be a hybrid between this form and *E. ligea*, which also occurs. The weather here was very uncertain; the first three days of my stay were lost as far as collecting was concerned; we had between seventy and eighty hours of rain without any cessation; then followed four very fine cloudless days, and afterwards more or less showery ones.

I here subjoin a list of the species taken:—

PAPILIONIDÆ.

Papilio podalirius. Buda Pesth; Herculesbad. Common.—Var. *zancleus*. Herculesbad; Belgrade, July 22nd.

P. machaon. Buda Pesth. Not very common.

PIERIDÆ.

Aporia cratægi. Salzburg; Modling; Herculesbad. Common.

Pieris brassicæ. Salzburg; Berchtesgaden; Modling; Buda Pesth; Herculesbad. Common.

P. rapæ. Ditto. Common.

P. napi. Ditto. Common.—Var. *bryonia*. Berchtesgaden.

P. daphidice. Buda Pesth; Herculesbad. Common.

Euchloë cardamines. Salzburg; Berchtesgaden. Rare.

Leptidia sinapis. Salzburg; Berchtesgaden; Modling; Buda Pesth; Herculesbad. Common.

Colias edusa. Modling; Buda Pesth; Herculesbad. Common.

C. hyale. Salzburg; Berchtesgaden; Modling; Buda Pesth; Herculesbad. Common.

Gonopteryx rhamni. Berchtesgaden ; Modling ; Buda Pesth ; Herculesbad.

Nymphalidæ.

Apatura ilia var. *clytie*. Several specimens came on board the steamer on the Danube between Vienna and Buda Pesth. I also saw it at Orsowa.

Limenitis camilla. Herculesbad. Common.

L. sibylla. Herculesbad. Rarer than the last.

Neptis lucilla. Modling ; Herculesbad. Rare.

N. aceris. Herculesbad. Common.

Pyrameis atalanta. Buda Pesth ; Herculesbad. Rare.

P. cardui. Buda Pesth ; Herculesbad. Common.

Vanessa io. Buda Pesth ; Herculesbad. Rare.

V. urticae. Salzburg ; Berchtesgaden ; Modling ; Buda Pesth ; Herculesbad.

V. xanthomelas. Herculesbad. Only one specimen.

V. polychloros. Buda Pesth. Rare.

V. antiopa. Salzburg ; Buda Pesth. Not common.

Polygonia c-album. Salzburg ; Buda Pesth ; Herculesbad. Fairly common.

Araschnia levana. Berchtesgaden. One specimen.

Melitæa maturna var. *urbani*. Salzburg. Only one specimen.

M. phœbe. Buda Pesth ; Herculesbad. Common.

M. didyma. Salzburg ; Buda Pesth ; Herculesbad. Common.

M. athalia. Salzburg ; Buda Pesth ; Herculesbad. At Buda Pesth extremely abundant ; in some spots the ground was literally carpeted with them.

M. aurelia. Buda Pesth.

M. dictynna. Berchtesgaden. Fairly common.

Argynnis euphrosyne. Salzburg ; Berchtesgaden.

A. dia. Modling ; Buda Pesth ; Herculesbad.

A. ino. Salzburg.

A. daphne. Herculesbad. Not uncommon.

A. amathusia. Herculesbad.

A. lathonia. Buda Pesth ; Herculesbad. Common.

A. aglaia. Berchtesgaden.

A. adippe. Modling ; Buda Pesth ; Herculesbad.

A. paphia. Herculesbad.

Melanargia galatea. Salzburg ; Berchtesgaden. — Var. *procida*. Herculesbad.

Erebia æthiops var. *leucotania*. Herculesbad.

E. ligea. Herculesbad.

Satyrus circe. Buda Pesth. Very common.

S. semele. Modling ; Buda Pesth.

Pararge egeria. Salzburg ; Berchtesgaden ; Modling ; Buda Pesth ; Herculesbad.

P. roxelana. Herculesbad. Five specimens only.

P. megara. Herculesbad. Not common.

P. hiera. Salzburg. Common.

P. mæra. Salzburg ; Berchtesgaden ; Buda Pesth ; Herculesbad.

P. achine. Berchtesgaden. Six specimens.

- Aphantopus hyperanthus*. Salzburg; Berchtesgaden; Modling; Buda Pesth; Herculesbad. Abundant.
Epinephela janira. Ditto. Abundant.
E. tithonus. Ditto.
Cenonympha arcania. Ditto. Usually abundant.
C. pamphilus. Ditto. Common.
C. tiphon. Salzburg; Berchtesgaden. Locally abundant.

ERYCINIDÆ.

- Nemeobius lucina*. Salzburg; Berchtesgaden; Modling; Buda Pesth; Herculesbad. Commonest at Herculesbad.

LYCÆNIDÆ.

- Thecla ilicis*. Modling; Buda Pesth; Herculesbad. Common.
T. acaciæ. Buda Pesth. Rare.
T. spini. Buda Pesth; Herculesbad. Common.
T. w-album. Herculesbad. Two specimens.
Callophrys rubi. Salzburg; Buda Pesth. Not common.
Zephyrus quercus. Herculesbad. Rare.
Chrysophanus virgaureæ. Herculesbad.
C. hippothoë. Salzburg; Berchtesgaden. Local.
C. alciphron. Herculesbad. One specimen.
C. phlæas. Herculesbad.—Var. *eleus*. Herculesbad.
Lampides telicanus. Herculesbad. Two specimens.
Lycana argiades. Buda Pesth; Herculesbad. Common.
L. argus. Salzburg; Buda Pesth; Herculesbad.
L. argyronomon. Salzburg; Buda Pesth; Herculesbad.
L. zephyrus. Herculesbad. One specimen.
L. orion. Modling; Buda Pesth; Herculesbad. Very blue above, and with large spots on under side, at Herculesbad.
L. astrarche. Salzburg; Buda Pesth; Herculesbad.
L. icarus. Salzburg; Berchtesgaden; Modling; Buda Pesth; Herculesbad. Common.
L. hylas. Berchtesgaden. Rare.
L. bellargus. Herculesbad. Common. Also at Belgrade.
L. corydon. Buda Pesth; Herculesbad. Local.
L. admetus. Buda Pesth. Local.
L. damone. Modling.
L. minimus. Salzburg; Berchtesgaden; Modling; Buda Pesth.
L. semiargus. Salzburg; Berchtesgaden; Modling.
L. melanops. Buda Pesth. One specimen.
L. arion. Berchtesgaden; Modling; Herculesbad.
Cyaniris argiolus. Berchtesgaden; Buda Pesth.

HESPERIDÆ.

- Heteropterus morpheus*. Buda Pesth. Locally abundant in a wood on the Schwabenberg.
Adopæa lineola. Buda Pesth. Common.
A. thaumas. Buda Pesth; Herculesbad. Common.
A. actæon. Herculesbad. Common.
Augiades sylvanus. Buda Pesth; Herculesbad.

Carcharodus lavateræ. Buda Pesth ; Herculesbad. Common.

C. alceæ. Herculesbad.

Hesperia alveus. Herculesbad.—Var. *fritillum*. Herculesbad.

These are all the species that I am able to record during June and July, 1900. No doubt, had the weather been less unfavourable, many more species would have been added to the list, especially in the more elevated regions. It will be noticed that very many common species are conspicuous by their absence, and several species which might have been reasonably expected to be taken, were not found, such as *Colias chrysotheme*, *C. myrmidone*, *Vanessa l-album*, *Erebia melas*, *Pararge climene*, &c.

All Saints Vicarage, Southend-on-Sea.

LEPIDOPTERA IN AUGUST IN SOUTH DEVON.

By G. H. HEATH, B.A., B.Sc.

WITH glowing visions of *Laphygma exigua* and *Leucania albi-puncta* before my eyes, I arrived at Babbicombe on Friday, Aug. 2nd, and promptly got to work. The first two nights were spent on Oddicombe Beach, where white flower-heads were sugared for *Leucania putrescens*, with very little result, the few specimens seen being badly worn ; in fact, out of a dozen seen at various times and places, only two were in fair condition. It seems to have been an early season for this insect, some ninety specimens being taken by one collector from flower-heads (unsugared) in July. Lantern and net produced a good set of *Gnophos obscuraria*, some very dark forms turning up.

The rest of the time was spent on the cliffs towards Torquay. I was fortunate in securing a run adjoining one of the places where *Lithosia caniola* is taken. The habits of this insect are very interesting. It seems to occur all round this piece of coast from Babbicombe to Torquay, but to be found in greater numbers at certain favourable spots. It spends the day on the perpendicular face of the cliff, and at dusk, or sometimes just before, it flies in numbers from its resting-place to the gorse-bushes on the steeply-sloping brow of the cliff. The female probably comes up first, and hides herself in the bushes, and the males follow in search of her. So great is the attracting power of the females, that as many as eight males were taken, hovering over the same bush, with one sweep of the net. This flight only lasts from ten to fifteen minutes, and on favourable nights the collector has his powers of rapid netting and boxing strained to the breaking point. In choosing a position there is a choice of evils. One may stand on the path on the brow of the cliff, some distance above the real edge, where *L. caniola* is not always so plentiful, but where

there is a little room to move ; or one may scramble down 30 ft. or so on to the extreme brink, and net the insects as they come up, with the pleasant thought that a too excited step will land one some 150 ft. below on the rocks or in the sea. That *L. caniola* does not confine itself entirely to the cliffs, I proved by taking three specimens from a lamp-post on my way home about half-past ten. My largest take on any one night was sixteen, and only once in three weeks did I fail to get any. The total result was about sixty specimens ; their condition very fair for such a fragile insect. Only one that I saw really looked as if just out.

For the first week the wind was in the south-west, and my run nicely sheltered, but nothing worth taking turned up. Then came a spell of strong east wind, and the results grew worse and worse, until matters reached a climax on the 21st, when only six very common things were found on about one hundred posts. This proved to be the darkness before the dawn, which came on my last two nights, the 22nd and 23rd ; the wind dropped, the air was dry and fairly warm, and insects began to come to sugar. By the worn appearance of most of them, it was not lack of insects, but bad conditions, which had prevented them from coming before. The chief catch on the 22nd was *Leucania albipuncta*, in very fair condition, but by no means fresh ; whilst the 23rd was signalised by a pair of *Laphygma exigua*—one fair, one badly worn.

Caradrina ambigua was first taken on the 14th, and turned up in ones and twos, but never abundantly. The takes of the last two nights also included *Lobophora viretata* (netted), *Calymnia affinis*, *Noctua plecta*, *N. c-nigrum*, *Leucania putrescens*, *L. pallens*, *Agrotis puta*, *A. suffusa*, and many other common species ; whilst a somewhat startling visitor to the sugar was *Locusta viridissima*, of gigantic size. *Apamea oclea* occurred in bewildering variety, sometimes approaching the colouring of *Mamestra persicariæ*.

On the whole, but for *Leucania albipuncta* and *Laphygma exigua*, the results were disappointing. With regard to the latter insect, it did not turn up till just ten o'clock, and was found on a post which had been examined not ten minutes before ; the second was found fifteen minutes later at nearly the same spot. I believe that systematic netting while examining the sugar would produce more of this rare little insect ; but this requires a skilled companion, and is not always possible.

Day-work at Babbicombe does not seem very productive. Beyond *Bryophila muralis*, only a few poor specimens of *Larentia olivata* and one *Anticlea rubidata* are worth mentioning. *Cidaria picata*, said to be found on the Bishop's Walk, was beaten for in vain, and, although the second brood of *Acontia luctuosa* was carefully hunted for, not a single specimen was seen. Most of the walls swarmed with *Bryophila muralis*, and I confined myself to a single piece about twenty yards long, clean and newish

looking, on which the insects were very easily seen ; on the best days ten or twelve were taken from this wall in as many minutes, and on the 18th I found five still on it at one p.m. in full sunshine. Some of the forms are olive-green—a form which seems peculiar to South Devon—whilst others approach the orange tint, for which Folkestone is famous. Altogether about fifty were taken, and it is possible to arrange them in an unbroken series from the colour of the typical *B. perla* to the dark olive-green. One fine large specimen was an exact reproduction in miniature of *Agriopis aprilina*.

Two visits to Dawlish were made on the 12th and 21st respectively. On the 12th *Callimorpha hera* was just appearing, and ten specimens were taken—a few in perfect condition. The yellow form (*flavescens*) seems to have increased to nearly 40 per cent. of the captures, while the intermediate orange form is getting more numerous. It is possible to arrange a series graduated from crimson to yellow. On the 21st only four *hera* were taken, but it still seemed to be emerging; the ground was so thick with collectors that it was almost impossible at ten o'clock to find a hedge that had not already been beaten. On both days the hedges teemed with geometers, the best being *Zonosoma porata* and *Acidalia immitaria*. On the 21st a single specimen of *Colias edusa* was taken, so fresh that it had probably only just dried its wings. The afternoon was spent in the warren in search of *Mesotype virgata*; in spite of a strong east wind eleven were taken, but more than half were too worn to be of value.

Altogether seventy-seven different species were taken in three weeks, and many more could have been secured.

102, Warwick Street, Eccleston Square, S.W.

A CONTRIBUTION TOWARDS A REVISION OF THE BRITISH TORYMINA.

BY P. CAMERON.

In this paper I have only dealt with the species I have in my own collection, and mainly the species I have reared. It is really more a revision of the Scottish species; for, to prepare a thorough revision of the British species, it would be necessary to make a critical examination of the collection of the late Mr. Francis Walker, now in the British Museum. There is no British list with which a useful comparison can be made; but Thomson (Hymen. Scand. iv.) records fifty-nine species from Scandinavia, and Mayr, in his Monograph of the European species (Verh. z.-b. ges. Wien, xxiv.), describes seventy-eight

species. My work has been greatly facilitated, and the identity of the species placed beyond dispute, by the aid of a valuable series of types which I received from Prof. Gustav L. Mayr.

MONODONTOMERUS, *West.*

1. *M. OBSCURUS*, *West.*

M. obscurus, Westwood, Phil. Mag. ii. 443; Mayr, Verh. z.-b. ges. Wien, xxiv. 68.

Callimone pubescens, Walker, Ent. Mag. i. 138.
New Forest.

2. *M. DENTIPES*, *Boh.*

Torymus dentipes, Boheman, Vet. Ac. Handl. 1833, 335.

Monodontomerus dentipes, Walker, Ent. Mag. ii. 158?;
Thomson, Hym. Scand. iv. 67.

One specimen from Mr. J. E. Fletcher taken on the windows of his house at Worcester.

DIOMORUS, *Walk.*

3. *DIOMORUS ARMATUS*, *Boh.*

Torymus armatus, Boh. Vet. Ac. Handl. 1833, 336.

Diomorus nobilis, Walker, Ent. Mag. ii. 159; Thoms. Hym. Scand. iv. 72, 1.

One example; Clydesdale. Bramble-stems.

SYNTOMASPIS, *Foer.*

Syntomaspis, Foerster, Hym. Stud. ii. 43.

4. *SYNTOMASPIS SAPHIRINA*, *Boh.*

Torymus saphirinus, Boheman, Vet. Ac. Handl. 1833, 371.

T. caudatus, Nees, Hym. Ich. Aff. Mon. ii. 60.

Callimone affinis, Walker, Ent. Mag. 1833, 133.

C. littoralis, Walker, l. c. 134.

Syntomaspis saphirina, Thomson, Hym. Scand. iv. 75, 3.

Common in galls of *Andricus terminalis*.

5. *SYNTOMASPIS PUBESCENS*, *Foer.*

Torymus pubescens, Foerster, Beitr. z. Mon. d. Ptero. p. xxx.

Two examples bred from galls of *Rhodites eglanteriae*; Clydesdale. Not hitherto recorded as British.

6. *SYNTOMASPIS FASTUOSA*, *Boh.*

Torymus fastuosa, Boheman, Vet. Ac. Handl. 1833, 347.

Callimone notatus, Walker, Ent. Mag. i. 134.

Syntomaspis fastuosa, Mayr, Verh. z.-b. ges. Wien, xxiv. 78;
Thoms. Hym. Sc. iv. 73.

Cladich, Loch Awe, June.

7. SYNTOMASPIS CYANEA, *Boh.*

Torymus cyaneus, Boheman, Vet. Ac. Handl. 1833, 366.

Callimone eurynotus, Walker, Ann. Mag. Nat. Hist. v. (2) 126.

Syntomaspis cyanea, Mayr, Verh. z.-b. ges. Wien, xxiv. 79;
Thoms. Hym. Sc. iv. 74.

Not uncommon in galls of *Dryophanta longiventris*.

OLIGOSTHENUS, *Foer.*8. OLIGOSTHENUS STIGMA, *Fab.*

Ex Bedeguar galls, Cheshire.

HOLASPIS, *Mayr.*

Holaspis, Mayr (*non* Gray), Verh. z.-b. ges. Wien, xxiv. 83.

9. HOLASPIS MILITARIS, *Boh.*

Torymus holaspis, Boheman, Vet. Ac. Handl. 1833, 338.

Holaspis militaris, Mayr, z.-b. ges. Wien, xxiv. 85; Thomson, Hym. Sc. iv. 70.

This genus has not been recorded from Britain before. I owe its record to Dr. T. A. Chapman, who sent me some galls of *Aulax rhœadis* from Hereford, from which the species was reared.

TORYMUS, *Dal.*

Torymus, Dalman, Vet. Ac. Handl. 1820, 135; Mayr, Verh. z.-b. ges. Wien, xxiv.

Callimone, Walker, Ent. Mag. i. 119.

Thomson (Hym. Sc. iv. 60) separates *Callimone* from *Torymus* through differences in the mandibles, the form of the metathorax and of the costal cellule, but these differences appear to me to merge so much into each other that I can hardly look upon them as of generic value. Thomson's *Callimone* represents the Section A of Mayr's Monograph.

10. TORYMUS ERUCARUM, *Schr.*

Ichneumon erucarum, Schrank, Enum. Ins. Austr.

Torymus fulgidus, Boheman, Vet. Ac. Handl. 1833, 345.

Callimone cynipedis, Walker, Ent. Mag. i. 119.

Torymus erucarum, Mayr, Verh. z.-b. ges. Wien, xxiv. 87;
Thoms. Hym. Sc. iv. 86, 11.

Parton, Loch Ken, Clydesdale. Rare.

A parasite of *Aphilothrix radialis*.

11. TORYMUS FULGENS, *Fab.*

Ichneumon fulgens, Fabr. Ent. Syst. Supp. 230.

Torymus fulgens, Nees, Hym. Ichn. Aff. Mon. ii. 61; Mayr,
Verh. z.-b. ges. Wien, xxiv. 88.

Callimone rosaces, Walker, Ann. Mag. Nat. Hist. xxii. 88.

Rare. Clober, near Glasgow.

12. *TORYMUS CHRYSOCEPHALUS*, Boh.

Torymus chrysocephalus, Boheman, Vet. Ac. Handl. 1833, 340; Mayr, Verh. z.-b. ges. Wien, xxiv. 89.

Callimone rudis, Walker, Ent. Mag. iv. 25.

Rare. Bishopton.

13. *TORYMUS ABDOMINALIS*, Boh.

Torymus abdominalis, Boheman, Vet. Ac. Handl. 1833, 343; Mayr, Verh. z.-b. ges. Wien, xxiv. 9.

Callimone angelicæ, Walker, Ent. Mag. iv. 25.

Common in galls of *Biorhiza terminalis*, *Aphilothrix curator*, *Spathogaster baccarum*, *Dryophanta divisa*.

14. *TORYMUS NOBILIS*, Boh.

Torymus nobilis, Boheman, Vet. Ac. Handl. 1833, 339; Mayr, Verh. z.-b. ges. Wien, xxiv. 92.

Callimone roboris, Walker, Ent. Mag. i. 120.

C. regalis, Walker, l.c. 119.

C. subterraneus, Curtis, Brit. Ent. xii. t. 552.

Gloucester; London districts. Galls of *Aphilothrix radialis*, *A. sieboldi* and *Biorhiza aptera*, all root galls.

15. *TORYMUS VENTRALIS*, Fonsc.

Cynips ventralis, Fonsc, Ann. Soc. Nat. xxvi. 286.

Callimone quadricolor, Walker, Ent. Mag. i. 120.

Torymus ventralis, Mayr, Verh. z.-b. ges. Wien, xxiv. 93.

T. affinis, Foerster, Beitr. z. Mon. d. Ptero. xxix.

Eccles, Dumfriesshire. Rare.

16. *TORYMUS REGIUS*, Nees.

Torymus regius, Nees, Hym. Ichn. Aff. Mon. 1834, 55; Mayr, Verh. z.-b. ges. Wien, xxiv. 95.

T. nigricornis, Boheman, Vet. Ac. Handl. 1833, 355.

Callimone inconstans, Walker, Ent. Mag. ii. 159.

C. lateralis, Walker, l.c. 159.

C. devoniensis, Parfitt, Zool. 1856, 5074.

Common. Galls of *Cynips kollari*, *Biorhiza terminalis*, *Dryophanta folii*, *Spathogaster baccarum*.

17. *TORYMUS AZUREUS*, Boh.

Torymus azureus, Boheman, Vet. Ac. Handl. 1833, 369; Mayr, Verh. z.-b. ges. Wien, xxiv. 100; Thomson, Hym. Scand. iv. 84.

Perth; from fir-cones inhabited by *Eupithecia togata*.

18. *TORYMUS CAUDATUS*, Boh.

Torymus caudatus, Boheman, Vet. Ac. Handl. 1833, 365; Thomson, Hym. Scand. iv. 84.

A Scotch example without note of locality. Worcester; from cones of *Abies* (J. E. Fletcher).

Mayr unites *T. azureus* and *T. caudatus*, but Thomson regards them as extinct species. My examples appear to show a variation in the length of the ovipositor compared to the length of the body.

19. TORYMUS BEDEGUARIS, L.

Ichneumon bedeguaris, Linné, Syst. Nat. ii. 939.

Torymus försteri, Ratzburg, Ichn. d. Forstins, i. 1844, 178.

T. bedeguaris, Mayr, Verh. z.-b. ges. Wien, xxiv. 101; Thomson, Hym. Scand. iv. 87.

Rare in the "bedeguar" galls of *Rhodites rosæ*. Thomson, l.c., regards *T. druparum*, Boh. sec. Mayr, bred from the fruit of *Prunus scandica*; and *T. elegans*, Boh. sec. Mayr = *varians*, Walker, Ent. Mag. i. 122.

T. varians, Walker, I am inclined, if I have correctly identified my specimens, to regard as a good species, and probably, as Mayr suggests, identical with *T. elegans*, Boh. It seems the more likely of *T. varians* being distinct from the bedeguar species from its different habits, it being a parasite on willow Cécidomyiæ.

20. TORYMUS VALLISNIERII, sp. nov.

Viridis, abdomine supra cupreo, subtus testaceo; alis hyalinis; pedibus flavo-testaceis, tibiis posticis infuscatis.

Long. fere 2; terebra 2 mm.

Clydesdale; ex galls of *Nematus gallicola*, West. (*vallisnieri*, Htg.).

Scape of antennæ testaceous beneath; the flagellum shining, metallic purple, variegated with green; the third and fourth joints equal in length. Head dark purple, slightly variegated with green, shining, very minutely punctured. Thorax green, strongly and closely punctured, closely covered with a microscopic fuscous pubescence; the median segment almost impunctate, shining, bare, more purplish in tint than the mesonotum. Pleuræ green, closely punctured. Legs pallid yellow, the coxæ green, except at the apex, strongly punctured; the hinder femora in the middle distinctly, the hinder tibiæ slightly infuscated; the apex of the hinder tarsi infuscated; the longer spur of the hinder tibiæ scarcely one-fourth of the length of the metatarsus. Wings clear hyaline; the nervures yellow. Abdomen dark purple, except the basal segment, which is green, and the sides at the apex which are slightly tinted with green; the ventral surface at the base broadly testaceous; the rest green suffused with bronzy tints.

Comes nearest to *T. abbreviatus*, but that is a larger and stouter species, has the ovipositor longer, the thorax and abdomen much more bronzy and shining, the ventral surface not

testaceous, the legs are of a brighter colour, and the antennæ are not shining metallic.

No species of *Torymus* has been recorded from the galls of *Nematus gallicola*; but two species of *Eulophus* and one *Pteromalus* have been reared.

21. *TORYMUS IGNICEPS*, Mayr.

Verh. z.-b. ges. Wien, xxiv. 103.

I have a specimen from Clober Wood, which agrees with Mayr's description, as well as an English example, differing, however, somewhat from it.

22. *TORYMUS ABBREVIATUS*, Boh.

Torymus abbreviatus, Boheman, Vet. Ac. Handl. 1833, 357;

Mayr, Verh. z.-b. ges. Wien, xxiv. 105, 20.

T. euchlorus, Boh. l.c. 359.

Callimone chloromerus, Walker, Ent. Mag. i. 128.

C. æqualis, Walker, l.c. 129.

Torymus chlorinus, Foerster, Beitr. z. Mon. d. Pter. xxx.

Rare. Cadder Wilderness; in galls of *Cecidomyia rosæ*. It is a variable species.

23. *TORYMUS FUSCIPES*, Boh.

Torymus fuscipes, Boheman, Vet. Ac. Handl. 1833, 374;

Mayr, Verh. z.-b. ges. Wien, xxiv. 108.

Two Clydesdale examples identical with a type from Mayr.

Mayr considers *T. chlorocopes*, Boh., as identical with *T. fuscipes*; but Thomson (Hym. Scand. iv. 85) considers the two to be distinct. With the material at my command I am unable to give an opinion.

24. *TORYMUS JUNIPERI*, L.

Ichneumon juniperi, Linné, Fauna Suec. 408, 1635.

Diplolepis juniperi, Fab. Syst. Piez. 1804, 150.

Torymus amethystinus, Boheman, Vet. Ac. Handl. 370, 1833 ?; Thomson, Hym. Sc. iv. 85.

Common in galls of *Hormomyia juniperina*, L. Clober Moor, Dumbartonshire.

25. *TORYMUS HIBERNANS*, Mayr.

Verh. z.-b. ges. Wien, xxiv. 111, 26.

Rare. Clober; in galls of *Neuroterus lenticularis*, in which they are laid in the autumn.

26. *TORYMUS TIPULARIARUM*, Zett.

Torymus tipulariarum, Zetterstedt, Ins. Lappon. 420; Mayr, Verh. z.-b. ges. Wien, xxiv. 111.

T. pumilus, Ratzburg, Ichn. d. Forstins. i. 180.

In the "rose" galls of *Cecidomyia salicis*.

27. *TORYMUS MACROPTERUS*, Walker.

Callimone macroptera, Walker, Ent. Mag. i. 124.

Torymus purpurascens, Nees, Hym. Ich. Aff. Mon. ii. 517.

T. macropterus, Mayr, Verh. z.-b. ges. Wien, xxiv. 114, 31.

Galls of *Rhodites spinosissima*; Troon, Arran; sand-hills at New Brighton. In galls of *Diastrophus rubi*; Worcester (J. E. Fletcher).

28. *TORYMUS AURATUS*, Fons.

Cynips aurata, Fons. Ann. Sc. Nat. xxvi. 284.

Torymus viridissimus, Boheman, Vet. Ac. Handl. 1833, 358.

Callimone autumnalis and *C. confinis*, Walker, Ent. Mag. i. 125.

C. mutabilis, Walker, l.c. 127.

C. leptocerus, Walker, l.c. 129.

C. minutus, Walker, l.c. 137.

Torymus muscarum, Nees, Hym. Ich. Aff. Mon. ii. 58.

T. propinquus, Foerster, Beitr. z. Mon. d. Pter. xxx.; Ratzburg, Ich. d. Forstins, iii. 223.

T. appropinquans, Ratzburg, l.c. 179.

T. auratus, Mayr, Verh. z.-b. ges. Wien, xxiv. 115.

T. viridissimus, Thomson, Hym. Scand. iv. 90, 18.

Common in many oak galls:—*Biorhiza terminalis*, *Andricus inflator*, *A. curvator*, *A. cirratus*, *A. ramuli*, *A. 4-lineatus*, *Spathogaster baccarum*, &c.

29. *TORYMUS AMÆNUS*, Boh.

Torymus amœnus, Boheman, Vet. Ac. Handl. 1833, 348; Mayr, Verh. z.-b. ges. Wien, xxiv. 117; Thomson, Hym. Sc. iv. 89, 15.

Callimone formosus, Walker, Ent. Mag. i. 122.

C. scutellaris, Walker, l.c. 123.

Torymus compressus, Foerster, Beitr. z. Mon. d. Pter. 1841, xxx.

Rare. In galls of *Aphilothrix radicis* and *Trigonaspis megaptera*. Clydesdale and Loch Awe.

30. *TORYMUS SODALIS*, Mayr.

Torymus sodalis, Mayr, Verh. z.-b. ges. Wien, xxiv. 120.

Not common. Clober; in galls of *Neuroterus lenticularis*.

31. *TORYMUS DAUCI*, Curt.

Callimone dauci, Curt. Brit. Ent. xii. 552.

Torymus dauci, Mayr, Verh. z.-b. ges. Wien, xxiv. 118.

New Forest. A parasite in *Cecidomyiæ* on *Pimpinella* and *Daucus*.

32. *TORYMUS GALII*, Boh.

Torymus galii, Boheman, Vet. Ac. Handl. 1833, 344; Mayr, Verh. z.-b. ges. Wien, xxiv. 121; Thomson, Hym. Scand. iv. 97, 31.

T. gracilis, Walker, Ent. Mag. i. 137.

Not common. Clydesdale; in galls of *Cecidomyia galii*, Winn.

33. *TORYMUS CAMPANULÆ*, Cam.

Torymus campanulæ, Cameron, Ent. Mon. Mag. 1880, 40.
Rare in galls of *Cecidomyia campanulæ*; Clydesdale.

34. *TORYMUS VIRIDIS*, Foer.

Torymus viridis, Foerster, Beitr. z. Mon. d. Ptero. p. xxx.
Rare. Clydesdale; in galls of *Rhodites eglanteriæ*.

35. *TORYMUS PRUNI*, Cam.

Torymus pruni, Cam. Trans. Ent. Soc. 1883, 196.
Milngavie; in galls of *Cecidomyia pruni*, Kalt.

VARIATION IN THE GENUS *EREBIA*.

BY GEOFFREY SMITH.

PART I.

DURING this and previous years I have collected this genus in the English Lake district, and in Savoy, with the purpose, shared by so many collectors, of studying its variability, and the problems connected therewith. The work of Dr. Chapman (Trans. Ent. Soc. 1898), who has based a means of identifying the different species by means of the gonapophyses of the male, has cleared the way for such studies, and is, I believe, absolutely reliable. It is a well-known fact that the various species of *Erebia* are extremely variable in their wing-facies; even when whole groups have been separated as persistent varieties from a type-species on the characters of their gonapophyses, &c., the various sub-groups or varieties are not at all homogeneous. There is great individual variability.

Side by side with this fact I should like to mention another fact even more striking, and that is the great preponderance of males over females in the majority of species. These two facts seem to me to be the leading facts with regard to the genus, and from habitually considering them together I have been led to suppose that there might be some causal connection between them. In trying to establish a causal connection between these two facts, it was necessary to treat the subject from a more or less statistical point of view; I have therefore used the means explained in Prof. Galton's 'Natural Inheritance' for drawing out a scheme of distribution of characters. The application of this scheme will become obvious during the course of this essay.

I have selected for the purpose in hand *Erebia epiphron* var. *cassiope*. This variety, in the regions in which I have studied it,

does not mix at all with the type-species, as the latter is entirely absent. The males are extremely variable in the character of their facies; the females, on the other hand, are practically constant, and in the proportion of about five to one hundred males. (This question of numerical disproportion of sexes will be treated of hereafter.) Although I have selected this variety as a concrete example on which to fix theoretical considerations, the general conclusions will apply to other species and varieties of this and other genera where the facts are similar.

The males of *E. epiphron* var. *cassiope* are widely variable in their wing-facies, but I want to fix on some variable character that can be treated numerically. Obviously the black spots on the rusty-brown patches will serve; they are extremely variable in number in the males, and, I believe, constant in the females. The constant number for the females will be taken as nine (it is really about seven), counting those on fore and hind wing. In Table I. is given a list showing an imaginary percentage of distribution of the spots among the males. An imaginary percentage is chosen for the sake of simplifying the numbers; it does not interfere with general conclusions.

TABLE I.

Sums from beginning.	Cases observed.	No. of spots.
10	10 per cent. had	0
20	10 " "	1
25	5 " "	2
30	5 " "	3
40	10 " "	4
55	15 " "	5
65	10 " "	6
75	10 " "	7
80	5 " "	8
100	20 " "	9

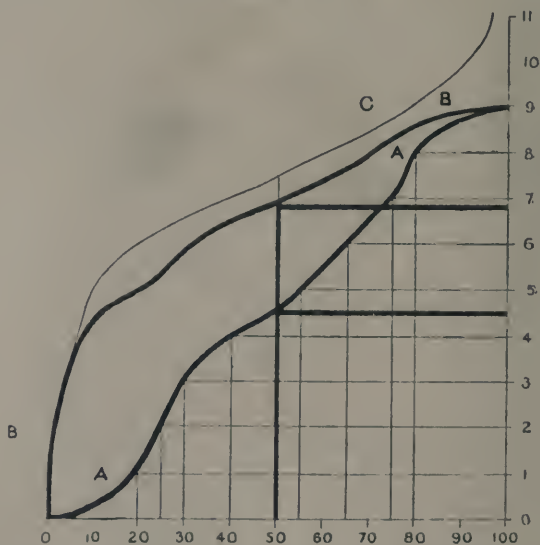
The contention is that if there were equal numbers of males and females—*i.e.* if all the individual males of Table I., with their various numbers of spots, could pair with a corresponding number of females with their constant number of spots (nine)—then the whole species would tend to return to the original stable condition of nine spots for males and females alike; but since only a small minority of the males can pair, the species is kept in a state of fluctuation.

It is necessary to make one preliminary hypothesis—that male and female in inheritance each transmit half their characteristics, and that this applies to the number of black spots. This ignores heritages from remote ancestors, but I have chosen $\frac{1}{2}$ as preserving the proportion between the two sexes, and not complicating the figures. Now, it might be argued from the

hypothesis, that if a male with four spots paired with a female with nine, the offspring would have $(\frac{1}{2} \times 4) + (\frac{1}{2} \times 9) = 6\frac{1}{2}$ spots each; but this is not intended, as it is contrary to observation, and also to theory, since, if the different aberrant individuals bred true, they would constitute varieties, and this is not the case. What the hypothesis does maintain is that $6\frac{1}{2}$ spots represent the average number of spots distributed more or less unequally among the offspring, *i. e.* it is the "spot-power" transmitted to the offspring. This may appear fanciful, but it must be remembered that it is symbolical of an established probability, and also that we are dealing with only one factor in heredity.

Now, I want to find the mean "spot-power" of all the individuals mentioned in Table I. This I do by drawing a Scheme of Distribution, utilizing for this purpose the columns 1 and 3 in Table I. By this means curve A of fig. I. is obtained.

FIG. I.



Note.—The lines for construction of curve B have been rubbed out, but they may be filled in again according to the explanation in the note at the end.

Curve A gives $4\frac{1}{2}$ as the mean "spot-power."

Now, I want to find out what would be the mean "spot-power" of the next generation if all the individuals of Table I. paired and produced offspring. The same percentages may be taken, as it is supposed that each pair produced an equal number of offspring; the only difference between the values in column 3,

Table I., and in column 6, Table II., is that the former represent numbers observed, and the latter represent averages of numbers calculated. Now, halving the values for each sex, we derive the following numbers from Table I.:—

TABLE II.

Sums from beginning.	Cases observed.	Spots observed.	♂ heritage.	♀ heritage.	Spots calculated for next generation of males, females ignored.*	
10 10 per cent.		0 0	+	4½	 4½	
20 10	„	 1	½	+	4½	 5
25 5	„	 2	1	+	4½	 5½
30 5	„	 3	1½	+	4½	 6
40 10	„	 4	2	+	4½	 6½
55 15	„	 5	2½	+	4½	 7
65 10	„	 6	3	+	4½	 7½
75 10	„	 7	3½	+	4½	 8
80 5	„	 8	4	+	4½	 8½
100 20	„	 9	4½	+	4½	 9

The mean must now be calculated from columns 1 and 6 in Table II. The curve is shown in fig. I., curve B. The mean is about 7.

If we compare the two means $4\frac{1}{2}$ and 7, we see that on the condition of every individual pairing an approach is made to the typical number of the species (namely, 9), by raising the mean every generation. It need hardly be remarked that a generation with a mean “spot-power” of 7 is likely to produce more individuals with the typical 9 spots than a generation with a mean “spot-power” of $4\frac{1}{2}$, and so on in ascending order. In this way, then, everything else being equal, the stability of the species would be regained to a very great degree after a few generations.

Now it is obvious that, if not only every individual in the tables does not pair, but, on the contrary, only a very small minority can ever possibly hope to, the whole equilibrium of the system is thrown out of order. A few individuals with various numbers of spots will succeed by chance in pairing with the few females that exist; these will then establish their “spot-powers” for the next generation, which will be overthrown in the next for one also established by chance, and not in any regularly ascending scale.

To show that this state of things would not lead to an equilibrium, we must follow the subject rather more closely. Let us suppose that the mean power 7 has been acquired by a generation in the way described, and that then the majority of the females has been destroyed before the possibility of pairing.

* Reasons for ignoring females will be given later. At present, regularity of increase is to be noted.

Now only a few of the males can leave offspring. Let us say, for the sake of simplicity, that only one male with a high power, 8, succeeds in pairing. The offspring of the union of that male with a female of the ordinary power 9 will have a power of $8\frac{1}{2}$. Now, among these offspring—say, 100 in number—any of the powers from 0 to 9 may occur in as many combinations as is possible without altering the average power $8\frac{1}{2}$. Of these offspring only one again can pair, of which we will take, for the sake of argument, one with a power of 2. In the next generation, then, the power will be reduced to $(\frac{1}{2} \times 2) + (\frac{1}{2} \times 9) = 5\frac{1}{2}$; so that the high value of the previous generation will have been wasted, and to no purpose. By this simple example it is shown how a continuous state of fluctuation would be preserved between the various possible powers owing to the scarcity of females.

In this way I believe that the two phenomena conspicuously exhibited by the genus *Erebia*—namely, great variability and scarcity of females compared to males—may be brought into causal connection. I have neglected numerous factors, such as reversion, continuous action of changed conditions, variability of the female; I have also treated the spots on the wings as definite or particulate inheritable entities, which may well strike terror into the heart of the entomologist; but this has been done more as illustrative of a process than as an actual statement of one.

How far the principle here numerically illustrated may be a general one, I neither know myself, nor have found stated in a book; but I hope to work some results out from *Erebia* material in this essay. The principle itself may be enunciated broadly as follows: that equality in the relative number of the sexes tends towards the stability of a species, and that a preponderance of one sex tends towards fluctuations of character, even though the actual tendency to vary remains the same.

In the case considered the female was not a variable quantity, but in other cases the variability of the female will have to be taken into account, which will alter the problem somewhat, as a mean value will have to be substituted for the constant $4\frac{1}{2}$ in our tables. This does not apply, however, to the particular example under consideration, which has been taken to give simple numerical expression to a rule which probably acts in nature extremely complexly, and which will be considered in different aspects later on.

EXPLANATION OF FIG. I.—The percentages in columns 1 of Table I. and 1 of Table II. are recorded on the graduated lower line. The number of spots in columns 3 of Table I. and 6 of Table II. determine the height of the vertical lines to be erected at the corresponding grades on the lower line. The points of intersection of the vertical and perpendicular lines are joined by a curve. To find the mean a perpendicular is drawn from grade 50 to meet the curve, and from

the point where this line meets the curve a vertical line is drawn to the scale recording the number of spots. The point where the line meets the scale is the mean (M). This mean, so calculated, has several properties: when the curve is symmetrically disposed on either side of it, it is equal to the arithmetical mean, and this is the case with the curves given here, so that the figures $4\frac{1}{2}$ and 7 might have been obtained by the ordinary method of averaging; but I determined to throw the figures into the form of a scheme, as this method will be of advantage later on. Although curves A and B are normal with respect to their M, they are not normal in general slope. Curve C is an example of a curve normal in slope and in all respects. The bearing of these different kinds of curves on the subject will be seen in the sequel.

(To be continued.)

ACHERONTIA ATROPOS AND SPHINX CONVULVULI IN THE HARWICH DISTRICT.

By Fleet Paymaster GERVASE F. MATHEW, R.N., F.L.S., F.E.S.

On August 14th a labourer brought me a fine larva of *A. atropos* and said that he found it under a bush while he was looking for mushrooms. This I doubted, but it showed me that the larvæ were already full grown, and as I wanted to breed a few to renew my old series, I paid a visit the following afternoon to a potato-field not far from my house, and, after a couple of hours' search, succeeded in finding seven, nearly all full grown. They were magnificent creatures, all bright golden green with the usual oblique blue stripes and dots. They were not difficult to find, for by walking slowly between the rows of potatoes one could see where the larvæ had been feeding, as the haulms in many instances were nearly stripped, and if the larva had not buried it was usually to be found upon the under side of one of the lower leaves. I found many plants so eaten by larvæ that had already gone down, which shows that they have been numerous and early this season. Where the plants were not of luxurious growth the larva was easy to see some distance off, and one fine fellow I detected nearly a hundred yards away, as it rested on a bare stem, where it looked very conspicuous in the rays of the setting sun.

My children were very much excited at my capture of these huge caterpillars, and the next morning, the 16th, four of them set out at 6 o'clock to look for more. When they came home to breakfast they said they had found three, but that they were smaller than mine, and two of them were green, and the third nearly black, and their horns were smooth; so, after breakfast, I went out into the garden to have a look at them, and directly I saw the first, which they took out of the large breeding-cage in

which they had been placed, I exclaimed, "Why, bless me, this is a *convolvuli*, not a death's-head!" and then one of the children remarked, "I expect the others are the same," and so the next one was; but the third—the dark one—was not forthcoming, having escaped through a hole in the muslin wall of the cage while we were at breakfast, and although a diligent search was made it could not be found.

Of course I was very much pleased at the sight of a British example of the larva of *convolvuli*, never having met with it before in this country, though I have frequently taken it on the Continent. My children told me that they found one on the ground between the rows of potatoes, one on a potato haulm, and the third fell off as they were walking among the plants. I may as well mention that this field is situated on the slope of a hill, that the soil is of a light and sandy nature, and the ground very foul, the potatoes being almost choked in places with masses of small bindweed (*C. arvensis*), chenopodium, knot-grass, &c. After this grand discovery I was anxious to try and find one of these larvæ myself, so I went off to the field at once and hunted till lunch time, the result being the capture of one *convolvuli* larva (the brown variety, as figured in Buckler's 'Larvæ of British Butterflies and Moths,' vol. ii., plates 21 and 22) and six more larvæ of *atropos*; but I found traces in several places where other larvæ of *convolvuli* had been feeding, and by the size of the frass had most likely already buried. The frass of *convolvuli* is rather elongated, and smaller at one end than at the other, whereas that of *atropos* is square, or brick-shaped; moreover, the frass of the latter lies in a mass under the plant upon which the larva has been feeding, while that of the former is found at intervals upon the ground, and by this means the larva can be traced.

On the morning of the 17th I went to another potato-field, more than a mile away from the first one, and worked from 10 until 1 p.m., finding one more *convolvuli* and five more *atropos*. In this field the haulms were of most luxuriant growth, being quite knee-deep, and the ground had been more carefully farmed, so that, with the exception of one corner, there was very little bindweed to be seen. This condition of things made it more difficult to see the larvæ, and the *atropos* I almost walked against before I noticed them. The *convolvuli* I found just as I was leaving the field. It was a small one about half grown, and was high up upon a potato haulm, up which some of the bindweed was creeping.

On Monday morning, the 19th, I received a small box by post from a coast-guard man stationed at Cornhill, near Dover, with a note to say that he thought the caterpillar enclosed "is the D. H. moth," but when I opened the box I found it contained a fine and nearly full-grown larva of *convolvuli*, which had been

packed with cabbage and potato-leaves, and so was in rather a famished condition, as it had been travelling since Saturday the 17th. It began to feed ravenously at once, and in a few days was full grown, and had attained to dimensions nearly as large as my largest *atropos*. This was a green larva, and as far as my experience goes green is the typical colour.

This is both a *convolvuli* and *atropos* year, for between the 19th ultimo and the date of this paper I have taken or had brought to me eight more larvæ of the former and more than twenty of the latter, besides having seen *convolvuli* flying at late honeysuckle in my garden, and having had several of the moths brought to me. I have also noticed traces of the larvæ of both species in every potato-field I have visited in this neighbourhood, and the larvæ of *atropos* have occurred in every little patch of potatoes in the cottage and allotment gardens around Harwich and Dovercourt.

As we have no weekly paper, and in order that my brother entomologists might know that these larvæ were about, I wrote to several of the daily papers to inform them, so that they might be on the look-out for them before it was too late. The result of this was that I was overwhelmed with applications from all sorts of people, asking me to send them larvæ, pupæ, or the perfect insects of each species. I also received several letters from gentlemen on the occurrence of *convolvuli*, from which I learn that it has been taken near Bridport, Manor Park, and Rye, and that it has been numerous in Jersey.

In the above remarks I have stated that I believe the green to be the typical form of *convolvuli*, so perhaps it will be as well to give a short description of the larva.

(A.) Typical form. Bright apple-green, with narrow black lines between the skin folds; oblique stripes bright yellowish green; head green, with black stripes each side of the cheeks; horn orange-red, tipped with black.

(B.) Var. 1.—As above, but with a subdorsal row of square-shaped black spots, and a large black blotch above each spiracle.

Var. 2.—Apple-green, with the oblique stripes broadly bordered above by purplish black, the stripes nearly meeting over the back, and those on the last two segments running up to the base of the caudal horn.

Var. 3.—The brown variety, as figured by Buckler, but difficult to describe.

It is a hard-feeling larva to the touch, and when annoyed curls itself into a ring, or violently jerks itself from side to side.

Dovercourt, Essex : Sept. 10th, 1901.

DESCRIPTIONS OF FOUR NEW SPECIES OF NOCTUIDÆ
FROM THE TRANSVAAL.

BY W. L. DISTANT.

THE moths here described will be figured in my 'Insecta Transvaaliensia,' and I have to thank Sir G. F. Hampson for his assistance in rendering their generic localisation in unison with his revision of the family.

Proruaca harmonica, sp. n.

Head and pronotum griseous brown, the eyes and anterior margin of the pronotum distinctly darker; abdomen greyish white, its apex fuscous; sternum ochreous white, the legs dark brownish, more or less mottled with greyish white, especially the tibiæ and tarsi. Anterior wings griseous brown, crossed at about one-third from base with an inwardly oblique and outwardly much angulated dark fascia, and with a similarly coloured but wider fascia commencing near outer angle, and at about one-third from its base bifurcating, the outer branch reaching costal margin near apex, the inner branch inwardly curved and reaching costal margin near the apex of the subbasal fascia, the outer margin of the bifurcated fascia being somewhat broadly dark purplish brown, with two prominent spinous angulations; posterior wings creamy white, the apices of the veins and a submarginal line palely fuscous. Both wings beneath creamy white, anterior wings with the apex dusted with fuscous, and with a marginal series of pale fuscous spots; posterior wings marked as above. Exp. wings, 40 millim.

Hab. Pretoria.

Xanthoptera carcaroda, sp. n.

Head, pronotum, and anterior wings dark chocolate-brown; abdomen, body beneath, legs, and posterior wings very pale fuscous; legs speckled and spotted with brown. Anterior wings with obscure darker lineate spots, and with an apical marginal series of castaneous short lanceolate fasciæ, the outer marginal fringe alternately marked with greyish; posterior wings with the fringe greyish. Long. 32 millim.

Hab. Lydenburg district.

Eutelia callichroma, sp. n.

Body above pale ochraceous, a macular central transverse fascia, and a subbasal spot to pronotum, two inwardly bent central discal fascia to abdomen united posteriorly and containing three intermediate spots dark brownish ochraceous; body beneath and legs pale ochraceous, the tibiæ and tarsi mottled with greyish white. Anterior wings ochraceous, mottled with brownish ochraceous, with two short oblique purplish brown fasciæ, the first at about one-third from base inwardly directed from beneath discoidal cell to inner margin, the second at about one-third from apex outwardly directed from costal margin to less than one-half across apical area, the inner fascia preceded and the outer fascia followed by a pale castaneous spot margined with ochreous

white; the inner fascia is also broadly outer margined with ochreous white, and is succeeded above by a large patch of plumbageous freckles; a subapical transverse dark fascia inwardly much angulated, and margined with ochreous white; posterior wings ochreous white, with two outer submarginal dark brown fasciæ, the outermost not reaching inner angle. Wings beneath paler, markings more or less obsolete, a distinct discoidal spot to posterior wings. Exp. wings, 28 millim.

Hab. Lydenburg district.

Plusia arachnoides, sp. n.

Head and pronotum dark brownish ochraceous, with transverse narrow greyish fasciæ, abdomen and body beneath very pale brownish ochraceous, legs brown, speckled with creamy white. Anterior wings obscure castaneous, the veins greyish, and with the following greyish linear fasciæ: two inwardly oblique about one-fourth from base, extending from beneath discoidal cell to near base of inner margin, two outwardly oblique crossing wing near centre of discoidal cell, and a duplex series of two, inwardly curved near apex, scarcely crossing wing half-way; posterior wings ochraceous, very broadly outwardly fuscous, fringe greyish white; anterior wings beneath brownish ochraceous, posterior wings generally as above. Exp. wings, 32 millim.

Hab. Pretoria.

NOTES ON THE DIVISION VELIARIA [RHYNCHOTA]

(=SUBFAM. VELIDÆ, LETH. & SEV.).

By G. W. KIRKALDY, F.E.S.

THIS division is in hopeless generic confusion at present, and a revision is impossible without an inspection of all the types. The tarsi of the intermediate and posterior legs are nearly always more or less distinctly trisegmentate, but as a rule the anterior tarsi are only, apparently, composed of a single segment; close inspection shows the presence of one or two other segments, but whether these are real sclerites or merely "nodes," like those found between certain of the antennal segments in—*e.g.*—*Gerris*, is contested. Accordingly, then, as authors have considered them as segments, or nodes (or have overlooked them altogether), have they described the anterior tarsi as 1-, 2-, or 3-segmentate. Thus *Neovelis*, F. B. White, and *Trochopus*, Carpenter, are probably not generically distinct from *Rhagovelis*, Mayr; *Veliomorpha*, Carlini, is also probably identical with *Microvelis*, Westw.; it is doubtful, too, if *Paravelis*, Breddin, can be regarded as distinct from *Velis*, Latr. *Perittopus*, Fieber, described from India (generically only) in a work on European bugs, is now described in full for the first time after a lapse of forty years. The other genera included in Lethierry and Severin's Catalogue are unknown to me except by description.

The *Veliiaria* are readily distinguished by the form of the sterna, which are subequal in length among themselves, by the short stout antennæ, the short, often stout, legs, &c. They are lacustrine, or fluvialile, except a few estuarine species of *Rhagovelia*.

PERITTOPUS, Fieber.

1861, Europ. Hemiptera, p. 33.

Apterous form: suboval; rostrum short, antennæ short, stout. Pronotum narrowly collared in front. Anterior tarsi apparently uni-segmentate (two minute basal nodes or segments), intermediate and posterior tarsi distinctly trisegmentate. Claws inserted posterior to the apex, in a slight cleft. Connexiva well developed, broad. Type, *P. breddini*, Kirk.

P. BREDDINI, sp. nov.

=? *P. rufus*, Fieber, *l.c.* (inedit.).

Ocelli large and distinct, a little nearer to the eyes than to one another or to the base of the head. First three segments of antennæ subequal in length, fourth about one-fifth longer than third, fusiform. Rostrum reaching to middle of the broadly sulcate mesosternum. Pronotum coarsely punctured, subconstricted laterally (*forma aptera*) at a little more than a third of its length, and tuberculo-elevate posterior to the constriction; subangulate-rotundate posteriorly. Femora not or scarcely incrassate. Segments of intermediate tarsi almost subequal (8 : 9 : 10). First segment of posterior tarsi very short, third slightly longer than second.

Sanguinescent; antennæ and legs black; anterior femora (except apex), base of intermediate and posterior femora, pallid fulvous; fourth segment of rostrum black. Eyes greyish black; ocelli rubid. Centre of pronotum blackish. Abdomen black; connexivum, segments six and seven, and genital segments pale sanguineous brownish. Ventral surface fulvous; legs, &c., paler.

♀. Apical margin of seventh segment above, truncate.

Long. 4 mill.; lat. $1\frac{2}{3}$ mill.

Hab. EAST JAVA, Tengger Mts. (coll. Breddin).

We owe the rediscovery of this handsome little species to the exertions of Mr. Fruhstorfer.

RHAGOVELIA.

Rhagovelia, Mayr, 1865, Verh. Zool.-bot. Ges. Wien, p. 445; Champion, 1898, Biol. Centr.-Amer. Rhynchota II. p. 133; Kirkaldy, 1899, Boll. Mus. Torino, xiv. No. 350, p. 4, and 1900, 'Entomologist,' p. 71 (type, *nigricans* (Burm.)).

Bæcula, Stål, 1866, Hem. Afric. iii. p. 167.

Neovelina, F. B. White, 1879, Journ. Linn. Soc. Lond. xiv. p. 487 (type, *trillii*, White).

Trochopus, Carpenter, 1898, Ent. Mo. Mag. xxxiv. p. 78 (type [*marinus*, Carp.=], *plumbea*, Uhl.).

(To be continued.)

NOTES AND OBSERVATIONS.

A FEW NOTES ON REARING *COSSUS LIGNIPERDA*. — Having been repeatedly told that it was difficult to rear this species, I determined to try for myself, and in September, 1900, collected a dozen larvæ from tree-trunks in this district. I placed them in a glass jar with some pieces of an oak-branch, covering the top with a piece of glass, and a weight to keep the larvæ from forcing their way out. They fed readily, and, spinning together the particles of gnawed wood and grass, converted the whole into a nearly solid elastic mass, in which they seemed very contented. Thus they remained until the beginning of February, 1901, when the jar was accidentally broken, and I transferred the larvæ to a tin biscuit-box in company with some pieces of poplar-bark. A few holes punched in the lid gave ventilation, and I did not open the tin again until June 20th. On that date, having occasion to visit the outhouse in which I had placed them, I took off the lid to see how the larvæ had fared, and found that, of my twelve larvæ, one (probably injured when the glass jar was broken) was dead, one was still feeding, and there were ten pupæ. These I removed to a breeding-cage, placing them on the bare wooden floor, and it was most amusing to watch them travel over this by means of their segmental hooks; with a curious sideways twist of the tail they got up quite a respectable pace. The first insect (a male) emerged on July 14th, and the remaining nine (six males, three females) during the following week, the last two making their appearance on the 23rd. They are all fine specimens, the three females being quite as large as any I have seen. During the hot days of September I have often seen the larvæ of *C. ligniperda* apparently sunning themselves on the trunks of infested trees; they keep the anal claspers just within the mouth of the burrow, and at the least alarm slip in backwards, and it needs some practice to catch them; if you do not seize them firmly at the first attempt, they slip through your fingers and are gone.—T. B. ANDREWS; 276, Broadway, Bexley Heath, Kent, August 24th, 1901.

SECOND BROOD OF *EPINEPHELE IANIRA* AND *E. TITHONUS*.—At Paignton, in South Devon, Mr. H. Main found, on August 20th, *E. ianira* in numbers in the freshest of condition, constituting without doubt a second brood; and on August 22nd, near Teignmouth, I met with *E. tithonus* under the same circumstances. *E. tithonus* was flying with poor worn specimens of the earlier brood. The fresh insects were particularly rich in colour, and in both cases the fringe on the wings was very perfect.—W. J. LUCAS.

DAVUS var. *ROTHLIEBI* AT DELAMERE.—I have read with considerable interest Mr. Arkle's remarks on the Delamere form of the above insect (*ante*, p. 257). I have collected some hundreds of specimens from this locality, and agree with Mr. Arkle in this, that the ocelli are on the average much larger than those of specimens from other districts; but I must confess that I have never been so fortunate as to take one with the ground-colour of the under wings "white," or, more extraordinary still, with "spots about a quarter of an inch across" (an enormous proportion to the size of the wing), nor have I seen a single specimen

anything approaching those described; and, being an entomologist who pleads guilty to "a weakness for 'spots' and 'undersides'," I fervently hope that Mr. Arkle will exhibit these remarkable aberrations at one or more of the Entomological Societies, and thus give pleasure to many who, like myself, are interested in the variation of species.—B. H. CRANTREE; "The Acacias," Levenshulme, Sept. 12th, 1901.

PTEROSTOMA PALPINA DOUBLE-BROODED.—I was much surprised, on looking one morning last month in my breeding-cage, to find five freshly-emerged specimens of the above-named species—two males and three females; and on visiting a friend near here a night or so later I found that he had had the same experience with his. We have made inquiries, and have come to the conclusion that the appearance of a double brood, the imago of which are about the normal size, is most unusual. I may add that at the present time I have healthy larvæ feeding from a pairing of this brood.—A. J. LAWRENCE; Bromley Common, Kent, September 11th, 1901.

LEPIDOPTERA OF LEWIS.—Mr. H. McArthur, who has been collecting in Lewis, the most northern island of the Hebrides or Western Isles of Scotland, returned to London early in September. Although he found sugar unattractive for moths, he succeeded in getting together a most interesting collection. The series of one or two of the species obtained are especially fine as regards aberration from typical lines, and he has also secured specimens of some species not previously recorded from the locality. We are indebted to him for an opportunity of seeing the entire collection, but must defer further remarks thereon until next month.

LATE BROOD OF PACHYCNEMIA HIPPOCASTANARIA.—On July 25th, 1898, I took *P. hippocastanaria* in the New Forest. The following year (July 20th) several specimens were obtained by my father and myself at Oxshott. These were all taken on heaths in the daytime. This year we took two very fine fresh specimens (August 4th) at Woking by searching the heather at night with a lantern. Is this insect regularly double-brooded? Of the four books I have by me, Meyrick gives May only, as also does Morley. Newman says May, and in France a second brood. Hofmann says July and August on the Continent, but, as he also gives these months for the larva, there is probably some mistake. One would be glad to know other collectors' experiences with this insect.—F. M. B. CARR; 46, Handen Road, Lee, S.E.

I took a male specimen of *P. hippocastanaria* at Oxshott on July 17th last, and was then under the impression that a summer generation of this species was unusual. Mr. Barrett, however, in the recently published vol. vii. of his 'Lepidoptera of the British Islands,' states that emergence takes place in April and May, sometimes as early as March, and that there is "a partial second generation in August." In 'British and European Butterflies and Moths,' by Kappel and Kirby, the time of the imago is given as "April to July." Other authors consulted only give the date of spring brood.—R. S.

THREE GENERATIONS OF SELENIA ILLUSTRARIA IN ONE YEAR.—*S. illustraria* being generally double-brooded, I thought perhaps the following

details of my experience would be interesting. From some chrysalids received in exchange I obtained specimens from March 12th to the 21st inclusive, the first being a male, which I killed, thinking it only an isolated case of abnormally early appearance. On the 16th, however, I was surprised to see another out, also a male; and on the 17th a fine pair, from which I obtained fertile ova on the 18th and 19th. These began hatching on April 11th, the larvæ beginning to pupate on May 22nd, the moths emerging from June 7th to 17th inclusive. From these I obtained ova on June 11th, 12th, and 13th, the larvæ appearing on June 26th and 27th, and starting to pupate on August 8th; and of course I expected these to hibernate in the pupa state, and was considerably surprised to see a specimen in the cage on August 20th, and others on the 21st, 22nd, and 23rd, all being males. I was disappointed at this, but on the 26th, however, I was delighted to see a pair in the cage, from which I obtained fertile ova, which commenced hatching on the 9th inst. I have thus succeeded in obtaining three distinct broods, the latter of which were the same size as the ordinary second brood. Now I come to what I think the most curious part of my experience, as I have still six large larvæ and two which spun up yesterday from the same lot of ova that produced imagines from August 20th to 26th inclusive. They are about three times the size of those which pupated from August 8th on. Thus, you will observe, I have larvæ from the same batch of ova, some of which pupated in six weeks, and two in about ten weeks; while I still have six feeding up, and, if I am successful in rearing, should produce very large specimens. All dates and particulars given in the above I have taken from my diary, which I keep posted from day to day, and which I find a splendid plan for reference should one require to obtain fresh series of any particular species at any time. — RICHARD GARRATT; 5, Clive Crescent, Penarth.

SESIIDÆ OF NORTH AMERICA.—We have just received vol. i. part 6, of the ‘Memoirs of the American Museum of Natural History,’ dated March, 1901, which contains a “Monograph of the Sesiidæ of America, North of Mexico.” It contains 136 pages of letterpress, and eight excellent coloured plates of the moths, and the galleries of their larvæ in the interior of the trunk, branches, stems, or roots of the plants which they attack. There are additional illustrations in the text, and a very full bibliography. The scientific portion of the work seems to be excellently done, and the destructive character is referred to of some of the species, of which the best known is our own Currant Clearwing (*Sesia tipuliformis*), which has been introduced with the currant into many other parts of the world, and is now common in Europe, North America, Australia, and even New Zealand. The references given by Mr. Beutenmüller fill more than two of his very large pages, in very small type.—W. F. K.

NORTHUMBERLAND ODONATA.—Mr. G. Bolam, of Berwick-on-Tweed, has forwarded to me for identification several dragonflies from the North of Northumberland. They are *Sympetrum striolatum* (Chathill); *S. scoticum* (Chathill); *Libellula depressa*; *L. quadrimaculata*, including one of the immigrants to Berwick noticed last year; *Æschna cyanea*, of which Mr. Bolam says that it is “the most common or best

distributed dragonfly in these parts and far north into Scotland"; *Ichnura elegans* (Chathill). The most interesting are *L. depressa*, of which I had no definite records north of Cheshire (though De Selys says it is found in all three parts of the British Isles), and *Æ. cyanea*, previous records of which north of Yorkshire needed confirmation. In connection with the last it should be stated that, although the specimen sent was *Æ. cyanea*, it is quite possible that some of the numbers mentioned by Mr. Bolam should be referred to its close congener, *Æ. juncea*, which is much more of a northern insect.—W. J. LUCAS; Kingston-on-Thames.

VISITORS TO SUGAR.—From time to time several uninvited visitors to lepidopterists' sugar have been recorded in these pages, chiefly amongst the Neuroptera and Orthoptera. A few more have come under my notice during 1901. *Phryganea minor* was taken in the New Forest on July 27th; and *Micropterna lateralis* in the New Forest in August; while the little cockroach *Ectobia panzeri* occurred freely at Dawlish in the middle of August. At Dawlish also there were considerable numbers of a brown insect belonging to the *Thysanura*, while in the New Forest two species of *Myriapoda* were noticed.—W. J. LUCAS; Kingston-on-Thames.

LARVÆ OF *CASSIDA EQUESTRIS* FEEDING ON HEMP-NETTLE.—Towards the end of July, Mr. Step gave me some larvæ and pupæ of a species of *Cassida* which he had found on Wisley Common feeding on hemp-nettle (*Galeopsis tetrahit*). I succeeded in rearing the specimens, which it was thought would turn out to be one of the uncommon species of *Cassida*; they however proved to be *C. equestris*. I do not think it is known that this species feeds on *Galeopsis*. Fowler gives its food-plant as species of *Mentha*, or mint. The specimens were only six days in the pupa.—S. W. KEMP.

NOTES ON *VANESSA IO* AND *V. CARDUI*. — It would be somewhat interesting to know the reason of *Vanessa io* being less abundant, especially in some districts, than either *V. atalanta* or *V. urtica*. Feeding as the larvæ do on the nettle so often abundantly distributed as a weed, and at times when both those other insects may be commonly seen, it seems difficult to account for the non-appearance of this butterfly. According to my own experience, it certainly seems to rather favour some districts more than others at the present day. In many a secluded valley in Wales, in some quiet combe of Somerset or Devon, there I have seen it in moderate numbers, season after season, when I I heard of its non-appearance in other localities apparently quite as favourable to its production—and that, too, when *urtica* and *atalanta* have been abundant. In Glamorganshire, Carmarthenshire, Cardigan, Montgomeryshire, Brecon, and Merioneth, I have seen both larvæ, these especially abundant at times, and the imago for several seasons. But I well remember, when a lad, that the "Peacock," as we then called it, used frequently to appear in gardens in Wiltshire in the early autumn at the blossoms of the asters and other flowers. Can the cause for this apparent scarcity arise from any ichneumon parasite attacking the larvæ being more abundant in some districts than others? or may the imagines be more delicate, and perhaps perish during their

hybernation? or may the larvæ be more often attacked by birds in some places than others? As regards hybernation, the Welsh valleys would be both *moister* and in many instances colder in the winter than in some other counties. In fact, it seems one of those mysteries in insect life difficult to comprehend and explain. And then of *Vanessa cardui*: its food-plant, a perfect pest often to the agriculturist, increased of late years in many districts, and yet this butterfly is scarcely seen season after season. In referring to my notes, I have only recorded 1892 as a good *cardui* year, although some few appeared in 1894, and this in a *seventeen years'* record. But *cardui* prefers, I think, warm dry districts like the limestone or chalk.—T. B. JEFFERYS; Bath.

CAPTURES AND FIELD REPORTS.

PIERIS DAPLIDICE IN JERSEY.—On Aug. 9th, while collecting at Pontac, in Jersey, I obtained a very good specimen of *P. daplidice*. I should like to know if this butterfly occurs commonly in the island.—S. F. P. BLYTH; Clevecland, Chislehurst, Kent, Sept. 4th, 1901.

COLIAS HYALE IN BERKSHIRE.—This is now the second year in succession it has been my good fortune to take the pale clouded-yellow butterfly, my first capture this season being on Aug. 20th, at Streatley, flying over clover. I then netted two specimens, and saw another, which I failed to catch. Since this date I have taken four more, all being very perfect, and apparently freshly emerged. Although I have carefully searched lucerne and clover fields, in full bloom, for *C. edusa*, up to the present I have not seen one. This is somewhat curious, considering how plentiful it was in both Oxfordshire and Berkshire last year.—HAROLD THOMPSON; 31, Beaumont Street, Oxford, Sept. 11th, 1901.

COLIAS EDUSA AND C. HYALE IN BUCKINGHAMSHIRE.—I had my first glimpse of *C. hyale* on Aug. 18th, at Chesham, when I gave chase to a specimen that was flying rapidly over a clover-field. It was not captured. On the 19th, when journeying from Chesham to Rickmansworth, I noted one *C. hyale* flitting about a small patch of lucerne, close to the line near Chalfont Road station. Finding clover-fields rather scarce at Rickmansworth, on the 21st I went to Chalfont Road and took two *C. hyale* on the patch of lucerne referred to; also two more from clover-fields when returning to Rickmansworth. I went again on the 22nd and took seven specimens, and on the morning of the 25th (a hazy morning) I netted four, and one example of *C. edusa*. Other *hyale* were seen, but only the one *edusa*.—G. B. OLIVER; Tettenhall, Wolverhampton, Aug. 27th, 1901.

COLIAS HYALE IN ESSEX.—We have at Southend this year an abundance of *C. hyale*. I have not seen it here in such numbers since the summer of 1892; then it was accompanied by *C. edusa*; this year the latter species is absent.—(REV.) HENRY C. LANG; All Saints Vicarage, Southend-on-Sea, Sept 3rd, 1901.

COLIAS HYALE IN HAMPSHIRE.—I had a fine specimen of this butterfly brought to me by a friend this morning, who also saw another,

which, however, he failed to capture. It is the white form and, judging from its fine condition, it appeared to be newly emerged.—FRED. G. BELLAMY; Ringwood, Sept. 6th, 1901.

COLIAS HYALE IN KENT.—During a short stay at Folkestone, in August, I took one female *C. hyale* on the 5th, and although I kept a sharp look-out during the succeeding days for others, did not see another until the 13th, when over some lucerne I captured two females and one male. Ova were obtained from two of these, but in neither case have they proved fertile. These were all the *Colias* I saw during the fortnight I spent in the neighbourhood.—JOSEPH H. CARPENTER; Riverdale, Leatherhead, Sept. 6th, 1901.

I have found this species pretty plentiful this year in Margate, Broadstairs and Ramsgate district. I arrived at Margate on Aug. 24th, and they had then been flying a fortnight; a friend up to that time had taken fifty. On the 26th a north-westerly gale sprang up, and continued, in varying degrees, till the 31st, when I left. In every patch of lucerne in the district which came under my observation *C. hyale* was to be seen. I had very little time to do any collecting, and, as so often happens, when I had a net the wind was strongest, and the sky became overcast; and when I had none the sun shone brightly, and *hyale* was plentiful. I managed, however, to bag in all thirty-two specimens, including two worn and two fresh pale females, twenty of which I took in an hour and a half, during a fine interval on the 30th. Given more leisure, and better luck in the way of weather, I have no doubt I could have trebled the number. I did not see a single specimen of *C. edusa*. At Folkestone, on Sept. 5th—a grand day—not a single specimen of either *C. hyale* or *edusa* was to be seen, and I have only heard of a few being taken there.—C. W. COLTHRUP; 127, Barry Road, East Dulwich, S.E., Sept. 17th, 1901.

I noticed a fair number of *C. hyale* on the cliffs beyond Margate a week or two since.—(REV.) HENRY C. LANG; All Saints Vicarage, Southend, Sept. 3rd, 1901.

C. hyale has again made its appearance in this district. I took four freshly-emerged specimens on the 18th inst., and two on the 21st, and have seen three others. I kept a sharp look-out on the lucerne fields all spring and early summer but did not see one, and had almost given up hope. Last year I took several specimens in June, and in September I obtained about thirty.—T. B. ANDREWS; 276, Broadway, Bexley Heath, Kent, August 24th, 1901.

COLIAS EDUSA IN KENT.—Since my note of the 24th inst. on *C. hyale*, *C. edusa* has also put in an appearance; I yesterday took twenty-five (twenty-four males and one female), and saw many more. *Hyale* is now more abundant than this time last year, but among thirty odd captures to date I have only taken five females.—T. B. ANDREWS; 276, Broadway, Bexley Heath, Kent.

COLIAS HYALE AND *C. EDUSA* IN KENT.—While collecting at Folkestone (Aug. 19th to 31st), with the help of two of my sons, we managed to net about a dozen fine *C. hyale*, but only saw two *C. edusa*. *Lycæna bellargus* (second brood) were out in plenty on the 20th, but all males. We did not see one female until the 23rd.—W. E. BUTLER; Hayling House, Reading, Sept. 7th, 1901.

Two friends and myself captured thirty-three specimens of *Colias hyale* and two of *C. edusa*, over lucerne at Sheerness, on August 24th last. I have now several larvæ feeding of the former species, from ova deposited during the last week of August. As usual, we found the females much scarcer than the males; in fact, excepting four or five, all were of the latter sex.—F. W. FROHAWK; September, 1901.

COLIAS HYALE IN SURREY.—I saw a nice specimen of *C. hyale* here on Aug. 31st. I was particularly pleased at seeing it, since, although I kept a sharp look-out, I did not see one last year.—L. M. SETH SMITH; Alleyne, Caterham Valley, Surrey.

VANESSA ANTIOPA IN BUCKS.—Two young entomologists, Messrs. Clavell and Ruthven Hore, of Dulwich College, have shown me a fine male specimen of the Camberwell Beauty, which they captured in a garden at Gerrards Cross, near Uxbridge, Bucks, on Sept. 7th. It is in very good condition, so that, according to current theories, I suppose that it was born and bred in England from Continental parents that came over in the spring. I may mention that the borders of the wings are completely white, although this character is now considered insignificant for distinguishing English from Continental specimens.—GEOFFREY SMITH; Ivy Bank, Beckenham.

VANESSA ANTIOPA IN ESSEX.—Mr. A. W. Tancock, writing from Chelmsford, records in the 'Field': "We had a Camberwell Beauty (*Vanessa antiopa*) here on Sept. 7th. We saw it sunning itself on a wall of the stable for several minutes shortly before one o'clock, and could easily have caught it if we had wished. It was seen in the kitchen-garden later in the afternoon. It was a fairly good specimen." F. W. FROHAWK.

VANESSA ANTIOPA IN SUSSEX.—A specimen was seen settled on a sunflower at Southwick, Sussex, on Aug. 26th last. My informant almost succeeded in capturing it, having placed a net over both flower and butterfly, but it managed to escape by darting downwards through the foliage.—F. W. FROHAWK; September, 1901.

LIMENITIS SIBYLLA IN WOOLMER FOREST.—On July 17th of this year I had the pleasure of seeing this insect in abundance, in the glades between the Portsmouth Road and Waggoner's Wells, near Grayshott. A. O. ROWDEN; 6, Eastgate, Exeter.

APATURA IRIS IN SUSSEX.—A splendid example of *A. iris* was taken, near Heathfield, on July 22nd last. It is a male insect, and is in perfect condition.—W. DELVES, Jun.; Maynards Green, Horeham Road, Sussex.

CYANIRIS ARGIOLUS ABUNDANT AT SOUTHEND.—This species has been very abundant here at Southend this season. It frequents my garden and other localities in the district every year, but this year we have seen it everywhere. The second brood has been specially noticeable by the unusual number of specimens, and even now, in the first week of September, some stragglers are left. I noticed a specimen about the second week of August, flying down Arundel Street, Strand; perhaps the species has established itself in the Temple Garden.—(Rev.) HENRY C. LANG; All Saints Vicarage, Southend.

LYCÆNA MINIMA (ALSUS) DOUBLE-BROODED.—With reference to Mr. L. M. Seth-Smith's note (*ante*, 254) on the capture of a perfect specimen of the above species on Aug. 5th, I found this little butterfly in some numbers at a certain locality in Western Hertfordshire, on Aug. 3rd last. All the specimens actually captured, nine in number, were in perfect condition, and had the appearance of having only recently emerged.—PHILIP J. BARRAUD; Bushey Heath, Herts.

ACHERONTIA ATROPOS IN KENT.—I have had a single pupa of this species given me at Deal, but it does not seem nearly so plentiful there this year.—C. W. COLTHRUP; 127, Barry Road, East Dulwich, Sept. 17th, 1901.

ACHERONTIA ATROPOS IN NORFOLK.—From the October issue of the 'Entomologist,' 1900, I noticed that the larvæ of the above species had been very abundant in Norfolk last year. I write now, after but a brief month's residence in Norwich, to report that it is undoubtedly very common in the neighbourhood this year. From Aug. 20th to Sept. 11th I have found nine *atropos* larvæ, received three pupæ from potato-diggers, and traced twenty other specimens. Though I had to snatch an hour or two when I could spare time, I have cycled out of the city on three or four points of the compass, and almost in every case found *atropos* in the very first patch of potatoes. For the majority I was too late, but systematic searching soon revealed denuded plants, with the frass lying in quantities below. The ninth larva has entered the cocoa-nut fibre provided for it, to-day.—(Rev.) ARTHUR MILES MOSS; The Close, Norwich, Sept. 14th, 1901.

ACHERONTIA ATROPOS IN NORFOLK.—I beg to report the occurrence here of three full-grown larvæ of *A. atropos*. The last of the three I obtained on Sept. 9th, one on Aug. 24th, whilst the first one was found on July 28th, and went down into the soil on that date. I had a number of *Smerinthus ocellatus* larvæ; these were all full-grown, and had gone down into the earth before the end of July. Previously I had never found full-grown larvæ before the middle of August and during September.—J. W. WOOLHOUSE; Summer Hill, Fakenham, Norfolk, Sept. 17th, 1901.

SPHINX CONVULVULI AT BROMLEY, KENT.—I caught a very fine specimen of *S. convolvuli* on Aug. 30th, in my garden here, at the blooms of *Nicotiana affinis*.—L. F. HILL; 2, Freeland's Road, Bromley, Kent.

SPHINX CONVULVULI IN THANET.—Two specimens of *S. convolvuli*, both males, in very fine condition, have been picked up at Margate, Sept. 4th and 9th (I also received a third specimen from Bridport, Dorset, taken Sept. 3rd; the latter, a female, exactly $4\frac{1}{2}$ in. across, travelled alive in a tin cigarette-box without much damage).—J. P. BARRETT; 3, St. John's Villas, Margate.

SPHINX CONVULVULI IN NORFOLK.—I received a living specimen of *S. convolvuli* on Aug. 20th. It was found here at rest under some leaves.—J. W. WOOLHOUSE; Summer Hill, Fakenham, Norfolk.

SPHINX CONVULVULI NEAR SOUTHAMPTON.—On Aug. 13th I caught a very large specimen of *S. convolvuli*, flying over tobacco-flower in a garden at Hythe, near Southampton. Two nights later another

specimen appeared, which I also caught; both are females, in very good condition, though not absolutely perfect. Towards the end of the month I saw another specimen, flying in the rain, which I failed to capture.—S. W. KEMP; 80, Oxford Gardens, Notting Hill.

SPHINX CONVULVULI IN SURREY.—On Aug. 25th last I found a specimen of *S. convolvuli*, at rest on a paling here.—L. M. SETH-SMITH; Alleyne, Caterham Valley, Surrey.

SPHINX CONVULVULI IN SUSSEX.—A fine specimen of *S. convolvuli* was taken here on Aug. 12th, and two or three have been seen since. W. DELVES; Maynard's Green, Horeham Road, Sussex, Sept. 3rd.

I was given a fine living specimen of *Sphinx convolvuli* a short time ago. It had been captured by one of the railway officials, and my friend saw it reposing, quite quietly, near the booking-office at Lewes station. The man stated there were several in the gardens near the line.—J. M. H. MACKINNON; Oaklea Warren, Newick, Sussex, Sept. 10th.

SPHINX CONVULVULI IN SCOTLAND.—A fine specimen of *S. convolvuli* was taken at Elgin, on Aug. 13th last.—HENRY H. BROWN; Cupar Fife.

SPHINX CONVULVULI PUPA.—I have recently received a very fine living pupa of *S. convolvuli*, which was found by a person employed digging potatoes on the Sussex coast, on Sept. 4th. This is the first living specimen I have seen, found in this county. In searching through the 'Entomologist,' vol. i. to present date, I find only two pupæ are recorded as having been found, one on Oct. 18th, 1876, and one on Oct. 31st, 1884. I think there is no doubt that *S. convolvuli* pupæ are but very seldom found, yet I think, if more careful observation were kept by potato-diggers, they would be more frequently turned up, especially as potato-fields overgrown with the wild convolvulus (*Convolvulus arvensis* and *C. sepium*) are usually the places where the larvæ feed. I may mention that my friend, Mr. Jos. F. Green, informs me that in North Suffolk *S. convolvuli* has swarmed since Aug. 17th last; on that evening he captured seven specimens, and they occurred so commonly each subsequent evening at the tobacco plants that he gave up capturing them. I have also received specimens from Sussex and Ireland, and notices of their appearance in Scotland. F. W. FROHAWK; September, 1901.

SPHINX CONVULVULI IN LONDON DISTRICT.—I have pleasure in announcing the capture of a specimen of the above insect near here, on the 20th inst., at rest on the framework of an electric street-lamp, in full glare of its rays. The evening was very showery, but at the time of capture there was no rain falling.—GEO. P. KITCHENER; 7, Montpelier Road, St. John's College Park, N.W., Sept. 21st, 1901.

MACROGLOSSA STELLATARUM.—We saw, for the first time this year, *M. stellatarum*, on the evenings of Sept. 7th and 8th. Last year several haunted the garden (especially a bed of *Phlox drummondii*) from the end of July on into November.—J. M. H. MACKINNON.

MACROGLOSSA STELLATARUM IN THANET.—*M. stellatarum* made its appearance on Midsummer Day, apparently having hybernated from October last (see *ante*, p. 21). I saw dozens early in July, but none before Midsummer. They were then in good condition, but rapidly

battered themselves. I think (and I have reason for thinking so) we have one brood; the larva is full-fed now, and the imago hibernates from October to May or June. I should like corroboration or otherwise of this.—J. P. BARRETT; 3, St. John's Villas, Margate.

STERNIA SACRARIA IN WORCESTERSHIRE.—I have just received from a neighbour, Mr. T. F. Bode, a specimen of *S. sacraria*, taken in August of last year, in his garden. The capture of this rare insect, described as "a casual immigrant only," in the very heart of England, seems worthy of note.—(Rev.) A. DAY; The Vicarage, Malvern Link, Worcestershire.

OROBENA EXTERNALIS (MARGARITALIS) IN SUFFOLK.—I should like to record the capture of *O. externalis* in the neighbourhood of Tuddenham, Suffolk (*vide* Bloomfield's 'Lepidoptera of Suffolk,' Supplement, p. 4). I took the first specimen in 1898, about the middle of June. This year I found them plentiful in one field, and a friend took twenty specimens in the same field a few days afterwards. This species is recorded for Cambridgeshire, I believe, but not previously for Suffolk.—E. G. J. SPARKE; 1, Christchurch Villas, Tooting Bee Road, Tooting, S.W., Sept. 24th, 1901.

XANTHIA GILVAGO AT TOOTING.—I took a good specimen of *X. gilvago* at sugar, in the garden here, about 9 o'clock last night. Last year I captured two examples of this moth in the same place, and about the same time, but they were somewhat damaged.—E. G. J. SPARKE; 1, Christchurch Villas, Tooting Bee Road, Tooting, S.W., Sept. 24th.

ZYGÆNA (ANTHROCERA) FILIPENDULÆ, Linn., IN BANFFSHIRE.—While my son and I were examining some grassy banks, thickly clothed with bracken and thistles, near the sea at Cullen, about midday on July 16th last, we came upon a swarm of *Z. filipendulæ*. On every thistle-head there were a few, and on some we counted six. Next day they were fewer, and in a few days they disappeared.—H. H. BROWN; Cupar Fife.

CALLIMORPHA HERA IN THE EXETER DISTRICT.—This insect appears to have been as abundant as ever this season between Exeter and Teignmouth, particularly in the neighbourhood of Starcross. As, however, records of its capture seem confined to the western side of the Exe estuary, it may be interesting to hear if entomologists have taken it on the eastern side. In August, 1900, I took two specimens (both males) on the Honiton Road, three miles east of the Exe.—A. O. ROWDEN; 6, Eastgate, Exeter.

[The earliest record of *C. hera* in England is that of Mr. D'Orville, who captured a specimen on August 14th, 1871, at Alphington, near Exeter. *Vide* Entom. v. 414, and xxv. 257.—ED.]

CATOCALA NUPTA IN LONDON.—I found a larva of *C. nupta* in Park Square, N.W., on July 19th. It became a pupa almost at once, and on Aug. 12th it produced a fine moth.—DORRIEN HODGE; Holy Trinity Rectory, St. Marylebone.

CIRRHIEDIA XERAMPHELINA IN NORTH WALES.—On Saturday, Aug. 24th, I took a fine specimen of *Cirrhiëdia xerampelina*, at rest on a pine-tree at Drwsynant, near Dolgelly, North Wales.—B. HICKLIN; Cranford, Winchmore Hill, N.

PLUSIA MONETA AT BROMLEY, KENT.—This species is becoming fairly common here. I have taken four this year, in my garden, and twenty-seven larvæ; of the latter, five spun up, and the moths emerged the middle of August; the rest are evidently remaining over till next year, so I have replaced them on the monkshood plants out of doors. Last season I caught five, and took fifteen larvæ towards the end of July, nine of which came out early in August. Has anyone noticed how much more plentiful the larvæ of this species are from the middle to end of July, than in May and early in June? The larva of the second brood spins the flower together, and is very easily discovered. L. F. HILL; 2, Freeland's Road, Bromley, Kent.

PLUSIA BRACTEA IN SCOTLAND.—I have much pleasure in recording the capture of *P. bractea* by Mr. A. E. Officer, at Conon Bridge, Dingwall, N.B., on August 19th. The insect came to an open window about 10.30 p.m.; it is rather rubbed on the thorax, but otherwise is a very fine specimen indeed.—WM. A. CARTER; Burr Villas, Bexley Heath, Kent, Sept. 9th, 1901.

ODONATA AT HYTHE, KENT.—During a stay at Hythe, Kent (August 22nd to Sept. 5th), the following dragonflies were seen or taken:—*Sympetrum striolatum*, fairly common. *S. sanguineum*, one male, in bad condition, by the Military Canal. *Ischnura elegans*, fairly common. *Æschna mixta*, one or more examples seen every day from Aug. 29th to Sept. 4th. I succeeded in obtaining two males and two females, whilst Mr. S. W. Kemp also took two males.—F. M. B. CARR; 46, Handen Road, Lee, S.E.

DEIOPEIA PULCHELLA IN SURREY.—Since writing you on July 7th (*ante*, p. 230), I have had the good fortune to take two further specimens of *D. pulchella*, in the same locality as my first capture. I should have taken a fourth example on July 15th, but it unfortunately escaped, owing to my inability to follow it, in consequence of the marshy nature of the ground. An additional point of interest is, that the larval food of this species, the forget-me-not (*Myosotis palustris*) occurs in the locality in abundance, conclusively proving that the presence there of this beautiful insect is not the result of accident or chance, but that it actually breeds there.—ERNEST WARNE; 4, Spanish Road, East Hill, Wandsworth, S.W., Aug. 13th, 1901.

[In reply to our request for further particulars, Mr. Warne writes, in a letter, dated August 30th]—The precise locality where I was fortunate enough to take *D. pulchella* is near Earlsfield, on some waste ground belonging to some factories on the banks of the Wandle. One portion is very marshy, and the other a grassy meadow. A wide and deep ditch from the Wandle divides the two. The other side of the river is rough ground, covered with short grass and weeds. The specimens are smaller than those I have seen in the museums, being not much larger than, say, *Lithosia helveola*. I took some examples of *E. chlorana* there, although I saw no osiers about. Probably they fed on the willows which line the bank of the river.—ERNEST WARNE.

BOLETOBIA FULIGINARIA AT WALTHAMSTOW.—On July 29th last I was fortunate enough to take a specimen of *B. fuliginaria* in my garden at

Hale End. The insect was flitting round a sugared post, though I cannot say whether it was attracted by the sugar or not; it is in good condition. I had never seen the species before, but it has been identified by my friend Mr. Prout.—R. W. ROBBINS.

RHIZOTROGUS SOLSTITIALIS.—In reference to Mr. P. J. Barraud's note (*ante*, p. 256) I may mention that during July this species was extremely abundant at Netley and Woolston, near Southampton. One could easily have taken hundreds almost any evening. A single specimen, taken in Plymouth, was given me, and a few were sent from Exmouth, together with a female *Dorcus parallelipipedus*. I may also note that on June 9th I captured three specimens of *Pachyta octomaculata*, near Plymouth.—A. VINCENT MITCHELL; 81, Salisbury Road, Plymouth, September, 1901.

CERAMBYX AEDILIS IN SOUTH YORKSHIRE.—It has been my good luck to have procured two of this, I believe, rather rare beetle, taken at the foot of a chimney, also near to a wood in the Rotherham district; three others were also put aside for me, but by some unexplained means they disappeared, with the boxes that contained them, probably the joke of a fellow-workman. Donovan, in his book of the 'Natural History of British Insects,' vol. ii., speaks of this species as scarce all over Europe, and extremely rare in England. I should be glad to know if it still remains rare in this country. My specimens were taken the second week in August.—W. BROOKS; Grange Hall, Rotherham.

ANESYCHIA (PSECADIA) BIPUNCTELLA.—I beg to record the appearance of *A. (P.) bipunctella* in my breeding-cage, on June 20th, 1901. Unfortunately I am not sure where I took the larva, as the insect is one of a number of micros I have reared, but believe it came in with some of my food-plants, which, however, did not include viper's bugloss.—J. T. FOUNTAIN; 149, Vaughton Street, Birmingham, July 24th, 1901.

[In answer to enquiries, Mr. Fountain informs us that the insect referred to in his note has been identified from the figure of *P. bipunctella* on plate 62 in Kirby's 'European Moths and Butterflies.' He also adds, "I have had no food-plants out of England."—ED.]

NOTES ON BUTTERFLIES FROM THE MARITIME ALPS.—Whilst on my holidays in July in the Maritime Alps, I had the good fortune to find *Læosopis roboris* unusually abundant at St. Martin Vesubie. I have on former occasions observed single specimens of this rare Lycaenid in that locality, and also at Digne, but do not think that it often occurs in France in such numbers as it did this year at St. Martin. I found a particular walnut sapling remarkably attractive; one of the branches had been broken accidentally by myself at my first visit to it during the last week of June, and probably the strongly-scented sap was the cause of attraction. Round this bush I took nearly forty specimens, and could have taken many more. I saw and took it in other parts of the environs of the town, and once noticed it actually in the town itself. The female was very scarce until the third week of July, after which it became the commoner sex. This species loves the hottest sunshine, and disappears instantly if the slightest cloud obscures the sun, though it can be beaten occasionally out of bushes and herbage

even in the rain. There are very few oaks in the vicinity of St. Martin, and these are all young trees. I have never seen it flying round oaks, but this is no proof that the larva selects any other food plant. *Papilio alexanor* was very much commoner at St. Martin than I have ever noticed on previous visits to that place, but nothing approaching in abundance to its appearance near Digne two years ago. With the exception of *Aeneis allo*, fairly common at the Madone Fenestro, I took nothing remarkable besides a well marked and freshly emerged hermaphrodite of *Melitæa didyma*, and, at Bollene, a curious aberration of *Lycæna arion*, with a very light ground colour and broad black marginal borders. At Bastia, in Corsica, I was struck with the abundance of *Argynnis pandora* and *Papilio machaon* on waste ground immediately outside the town. I have rarely noticed butterflies so abundant within a few moments' walk of busy town streets. The railway strikes prevented my intended visit to the interior.—HENRY C. LANG; All Saints Vicarage, Southend-on-Sea.

NOTES ON LEPIDOPTERA FROM WILTSHIRE.—During part of the summer I was staying near Devizes, and the following is a list of some of my captures whilst there. May:—Several specimens of *Scotosia certata*, caught at dusk flying round *Berberis vulgaris*; *Lycæna argiolus*, the first brood was very plentiful. June:—*Lycæna alsus*, generally distributed along the foot of the Downs. *L. adonis* and *Procris geryon*, both in profusion on the slopes of the Downs. *Agrotis cinerea*, one female specimen at rest on wild thyme. *Eurymene dolobraria*, one specimen in perfect condition on the top of the Downs far from trees of any kind. *Charocampa elpenor* and *C. porcellus* and *Sphinx ligustri*, all taken at honeysuckle towards the end of the month, the former in some numbers. July:—I was so fortunate as to capture two specimens of *Plusia moneta* on the wing at dusk—a female on 15th, and a male on 19th. There is plenty of larkspur (*Delphinium*) in the garden, but no monkshood (*Aconitum*). I have seen records of the capture of *P. moneta* this year from Berks and Hunts, but this is, I think, the first recorded occurrence of the species in Wilts. This addition to our British Lepidoptera seems to be spreading rapidly through the country. August:—*Lycæna corydon* began to appear in its usual profusion over the Downs at the end of July, and on August 9th I caught my first two specimens of the season of var. *syngrapha* (the female variety of *L. corydon* with the blue colouring of the male). The commonest form of this variety here has a black discoidal spot in the centre of the fore wings; some are without this spot; and I caught one this year with the spot on both fore and hind wings. Another not uncommon variety of *L. corydon* (female) has white discoidal spots, with or without black centres, on fore or hind wings, and sometimes on both. I also caught one female specimen with blue fore wings and brown hind wings. *L. alsus* was taken in perfect condition this month, and must, I should think, have been a second brood. Emergence of the second brood of *L. argiolus* and *L. adonis* was interrupted by bad weather, and they occurred in small numbers only.—(Rev.) C. A. SLADEN; Burton Vicarage, Chester.

RECENT LITERATURE.

H. GARMAN. *Enemies of Cucumbers and Related Plants, &c. : The Food of the Toad.* (1901 Bull. Kentucky Agric. Exper. Sta., 91 pp. 1-68; 5 Plates and 10 text figs. [1-16]).

Among the most destructive enemies of cucumbers are—*Diabrotica vittata* and *12-punctata*, among beetles; *Aphis gossypii* (melon louse), *Anasa tristis* (squash bug), &c., among bugs; *Margaronia nitidalis* (pickle worm), among moths; *Thrips tabaci*, &c. These and others are fully described and figured, particulars of life-histories added, and remedies discussed.

"The Food of the Toad" is the result of a continuation of the author's earlier studies. Protection and encouragement are urged for the toad on account of the numerous destructive insects that it devours; among these, Prof. Garman found in the toads' stomachs—*Blissus leucopterus* (chinch bug), various aphids and leaf-hoppers, Colorado potato-beetle, wireworms, &c. On the other hand, coccinellids, spiders, and parasitic hymenoptera were also found. The fondness of toads for ants is remarkable, fifty of these having been found in the stomachs of three toads. The total number of individual insects devoured is also very remarkable. Four cases are instanced:—

No. 1—A toad of medium size, captured in October, had eaten 27 ants, 19 wood-lice, 3 spiders, 1 caterpillar, and 10 plant-lice—total 60.

No. 2—A toad, one inch long, captured in a celery patch in September, had eaten 1 caterpillar and 14 ants—total 15.

No. 3—Captured in a strawberry patch in August, had eaten 2 large ground beetles, 1 tiger beetle, 1 *Diabrotica* beetle, 1 coccinellid, 8 small ground beetles, and 9 ants—total 22.

No. 4—taken in July, had eaten 2 Colorado potato-beetles, 1 click-beetle, 4 bugs (Cydnids), 1 tiger beetle, 1 moth, 7 ground beetles, 6 ants, 1 millipede, and 1 wood-louse—total 24.

That is to say: four toads had recently eaten 56 ants, 20 wood-lice, 3 spiders, 2 caterpillars, 10 plant-lice, 1 millipede, 1 moth, 24 beetles of varying sizes, and 4 bugs—total 121!

G. W. K.

The Lepidoptera of the British Islands. By CHARLES G. BARRETT. Vol vii. Pp. 1-336. London: Lovell Reeve & Co. 1901.

In this volume the remainder of the Boarmiidae, together with the Geometridae and part of the Acidaliidae, are treated. Altogether, forty-three genera and eighty-five species are referred to. Among the latter *Abraaxas pantaria*, *Dasydia torvaria*, and *Mniophila cineraria* are mentioned, but the author does not consider them to be British species. *Tephrosia biundularia*, Esp. (= *crepuscularia*, Hübn.) is discussed at some length, and Mr. Barrett, in his remarks on the *crepuscularia* form of the species, says: "The subject of its distinctness as a species has been treated upon and debated in this country at enormous length, and not wholly without acrimony; but this healthy and somewhat drastic treatment has had the effect of crumbling away every atom of evidence which had been brought forward to establish its distinctness as a species, and of leaving no choice to an unprejudiced mind but the conclusion that these two races form but one species."

We think that an error has been made in referring *B. angulifera*, Butl., to *B. repandata*, Linn., as a Japanese form of that species, and, unless *B. admissaria*, Guen., is to be considered as a form of *B. gemmaria*, Brahm., we believe the latter species does not occur in Eastern Asia.

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[No. 462.

ON NAMES APPLIED TO CERTAIN SPECIES OF THE PIERID GENUS *CATASTICTA*.

BY ARTHUR G. BUTLER, Ph.D., &c.

IN 1897 the late Dr. Otto Staudinger wrote to inform me that he was meditating upon the publication of a Revision of the genus *Catasticta*, and he asked me to let him have papers published by me in which species of that genus were described.

Although I cannot discover that the proposed Revision was ever published, certain names proposed by Dr. Staudinger have become well known amongst dealers, and specimens are being sold broadcast, under these names, to the entomological public.

It was an unfortunate fact that the late Dr. Staudinger, whose care in the determination of Palearctic Lepidoptera earned him a world-wide reputation, was, unfortunately, by no means so careful when dealing with exotic species. In the case of *Catasticta* he has given manuscript names to several species without taking the least trouble to ascertain whether or not his supposed new species are identical with those long previously described from the same localities.

As it is most important that Staudinger's proposed names should not be accepted without examination, and the species described as new to science, I propose to state what they are (so far as I have hitherto come in contact with them), and, if new, I shall adopt his name and describe.

I have met with the following in the Crowley collection:—

1. *ARCHONIAS PHILEMON*, Staudinger; from Bolivia.—This is typical *Catasticta colla*, Doubleday, from Bolivia.
2. *ARCHONIAS CORNELIA*, Staudinger; from Bogota.—This is typical *Catasticta hebra*, Lucas; from Colombia.
3. *ARCHONIAS OPPOSITA*, Staudinger, from Bolivia.—This is typical *Catasticta manco*, Doubleday; from Bolivia.

4. *ARCHONIAS HOPFFERI*, Staudinger; from Bolivia.—This is typical *Catasticta pinava*, Doubleday; from Bolivia.

6. *ARCHONIAS JACINTA*, Staudinger; from Bolivia.—This is a new species, near to *Catasticta chelidonis*, Hopffer.

7. *ARCHONIAS TAMINA*, Staudinger; from Manizales, Orinoco, &c.—This is typical *Catasticta tomyris*, Felder; from Bogota.

It seems probable that this species was confused, by the late Dr. Staudinger, with *Catasticta toca*; both species occur in Bolivia.

I may add a note upon a species described by Mr. Mengel under the name of *Archonias xequé*. The latter is typical *Catasticta chrysolopha*, Kollar.

The following new species from the Crowley collection may be described:—

CATASTICTA CROWLEYI, sp. n.

Intermediate, in some respects, between *C. potamea* and *C. strigosa* (= *actinotis* ♂), the pattern of the upper surface being that of the latter species, excepting that the discal series of five spots on the secondaries is clearly defined and separate from the pale basal area; upper surface dark purplish brown, with the pale areas and spots whitish ash (bone-white, irrorated with blackish when seen through a lens); the outer border of the secondaries and the veins being thus very sharply defined; an orange spot on each side of the collar; under surface much the same as in *C. actinotis* ♂, but the secondaries of a paler lilacine brownish tint, with no defined central dark belt, the yellow spots only being attached to dark brown hastate markings; expanse of wings, 55–58 mm.

Monte Sierra and Culata, Venezuela. (Three males.)

My *C. strigosa* was described from a Peruvian example, which differs slightly from those since received from Central America; but there can be no doubt that these discrepancies are not of specific value when one has an opportunity of comparing them in the insects themselves; the greenish tint of *C. actinotis*, male, is very characteristic, and separates it at a glance from the brownish *C. potamea*, the white-marked *C. hebra*, and the whitish ash-marked *C. crowleyi*.

CATASTICTA JACINTA, sp. n.

Archonias jacinta, Staudinger, in litt.

Closely related to *C. chelidonis* and *C. zancle* (= *C. cora* ?); nearer to the latter, from which it chiefly differs in the slightly narrower ochreous belt across the primaries, the smaller double spot in the angle of the discoidal cell, the more widely blackened veins, the broader blackish base to the secondaries, and the consequently narrower ochreous belt crossed by black veins. The ochreous markings above are also of a more creamy (less orange) tint than in *C. chelidonis*. On the under surface the basal area of the primaries is broadly smoky brown; all the yellow markings are clearer, more lemon-tinted; the veins are blacker, the submarginal lunules on the

primaries less elongated: otherwise the two species are similar. Expanse of wings, 53-56 mm.

Bolivia. (Three males.)

CATASTICTA APATURINA, sp. n.

Nearly allied to *C. toca*, but the primaries produced and sub-angulated, the secondaries subtriangular with elongated anal angle (giving this species much the outline of some of the species of *Apatura*). The upper surface sooty black, with white markings irrorated with black, arranged nearly as in *C. chrysolopha*, but the outer row of white spots small and ill-defined on the primaries and almost obliterated on the secondaries; the secondaries are marked more nearly as in *C. toca*, the band being wholly white, but narrower and distinctly divided at the median vein in the males; the colouring of the under surface is nearly as in *C. toca*, but distinctly yellower and brighter; the trident-like marking at the base of the radial and median veins on the secondaries is larger, better connected, and of an ashy slate-colour, completely enclosing three small yellow spots. Expanse of wings, 47 mm.

Angamarca, Ecuador. (Two males, one female.)

LEPIDOPTERA IN CENTRAL GERMANY.

By J. JÄGER.

IN the 'Entomologist' for January, 1892, appeared an article of mine, with a short geographical description of the small town of Biedenkopf on the Lahn, in Hessen-Nassau, and its surroundings, including a list of Rhopalocera found by me during August of the preceding summer. After an interval of ten years I have once more paid a visit to this charming spot, and, as it happened, I met my nephew, Mr. Richard Werner (of the firm Siemens and Halske, Berlin), also a zealous entomologist, spending his summer holiday there. On our daily walks in the midst of lovely mountain scenery we came in contact with a profusion of insect life, chiefly Rhopalocera, a list of which, seen and captured on the morning of Aug. 9th, I will here enumerate:—*Papilio machaon*, common principally in clover fields. *Pieris brassicæ*, *P. napi*, and *P. rapæ*, all very common. *Leucophasia sinapis*, sparingly. *Colias hyale*, very common. *Gonopteryx rhamni*, very common. *Argynnis selene*, very common. *A. latonia* and *A. dia*, common. *A. paphia* and *A. adippe*, in great numbers. *A. aglaia*, few and worn. *Vanessa urticæ* and *V. io*, common. *V. polychloros* and *V. c-album*, a few specimens. *Vanessa atalanta*, just appearing. *V. antiopa*, common near orchards. Our captures of this species amount to about forty altogether. *Melanargia galatea*, common, but worn. *Erebia*

medea and *E. ligea*, very common. *Pararge egeria* and *P. megæra*, a few specimens, common. *Satyrus semele*, a few specimens. *Epinephele ianira*, very common. *Cænonympha pamphilus*, very common. *C. arcania*, a few specimens. *Thecla betulæ*, a few specimens. *Polyommatus virgaureæ*, common, but worn. *P. doris*, common. *P. phlæas*, fairly common. *Syrichthus malvæ* and *S. alveolus*, a few specimens. *Hesperia comma*, very common. *Lycæna icarus*, very common. *L. astrarche*, common.

Among the day-flying Geometridæ *Ortholitha mœniaria* and *Fidonia brunnæata* were most common, whilst the Zygænidæ were represented by two or three species, of which *Z. pilosellæ* was the most prominent.

Of the Pyralides, *Spilodes palealis* was frequently met with.

Before my arrival the following species were captured:—*Apatura iris*, very common in the mountain paths (latest July 23rd), estimated captures from eighty to ninety; also several specimens of *A. ilia* and the var. *clytie*. *Limenitis populi*, about June 23rd, several specimens. *Satyrus circe* (*proserpina*) and *S. briseis*; *Vanessa prorsa*; *Aporia crataegi*.

At the soapwort (*Saponaria officinalis*) growing on the banks of the river the following Sphingidæ were taken nightly:—*S. pinastri*, *S. convolvuli* (from July 13th to October, about 120 specimens), *Deilephila euphorbiæ* (about eighty), *Chærocampa elpenor*, *C. porcellus*.

After an absence of five weeks I returned again to Biedenkopf on Sept. 30th; during this interval an unusual number of *Catocala fraxini* (about 200) and a few *C. nupta* had been taken from ash-trees in an avenue near the town, the time of appearance extending from Aug. 25th to Sept. 28th. With the exception of a few additional buildings, I found the place very little altered since 1891; but there is a new and charmingly situated hotel (Berggarten) on a mountain slope overlooking the river and town, at which board and lodging (*en pension*) can be obtained at the rate of four to five shillings per day). From a verandah in front I have spent many hours watching the elegant flight of *V. antiopa*, which used to resort to a willow-stump, the sap of which seemed even more attractive to them than the pears and plums on the neighbouring trees.

In conclusion, I may mention that, beyond visiting the honeysuckle and soapwort near the river at dusk, Heterocera have never been worked for in this district, sugaring and other methods being comparatively unknown. I therefore think that, if the neighbourhood were systematically worked, some good results might be obtained. I shall be pleased to give further information to any one who may desire it.

FOUR MONTHS' COLLECTING IN THE ISLE OF LEWIS.

Mr. McArthur, whose return from a four months' expedition to the Isle of Lewis we announced last month (*ante*, p. 288), has again been successful in adding to our knowledge of the lepidopterous fauna of that part of Great Britain, but, as was naturally to be expected, not to the same extent that he did in 1887. Altogether, the increment amounts to seventeen species, but of several of these only one or two examples were obtained. The additions to the list published in the 'Entomologist' for 1888 (xxi. 25-27) are—*Vanessa urticæ*, *Macroglossa stellatarum*, *Noto-donta dromedarius*, *Stilbia anomala*, *Acosmetia caliginosa*, *Agrotis simulans*, *Noctua augur*, *Triphæna janthina*, *Pachnobia rubricosa*, *Tæniocampa gothica*, *T. stabilis*, *Hadena rectilinea*, *Cucullia verbasci*, *Plusia iota*, *Cidaria miata*, *Carsia paludata* (one), *Euchromia arbutella*.

Some species that were abundant in 1887 were not seen at all this year. *Bombyx rubi*, for example, was in swarms all over the island on Mr. McArthur's previous visit, but he did not observe even one on this occasion. On the other hand, *Dicranura vinula*, of which species only one specimen had been previously met with, was fairly common, both as imagines and larvæ.

Hadena rectilinea was represented by two female examples, both larger and darker than those occurring on the mainland. A fine batch of ova was obtained from one of the females, and the larvæ resulting therefrom were fed up on sallow. Unfortunately, just when full grown, they all, some two hundred odd in number, died within four days.

Vanessa urticæ was seen in considerable numbers during the spring on Eye peninsula, but these were left to perpetuate their kind. Later on in the season, three journeys were made to the locality, with the view of finding larvæ of the species, but without success. A fourth trip, however, resulted in the capture of two imagines, which, from their fine condition, had not long emerged, left no doubt that larvæ had fed up there.

Lycæna icarus.—Some of the males have black dots on the outer margins of the hind wings (upper surface), and the proportion of such specimens is, perhaps, greater than was the case in 1887.

Hepialus humuli.—In the course of his observations on the habits of this species, Mr. McArthur noted that the males, after having attracted the females and paired, fly around tree tops and the upper ridges of the cliffs, &c. The specimens were quite normal.

Agrotis cursoria.—The Shetland form of this species occurs in Lewis, but not in Orkney.

Noctua brunnea.—All the specimens have a beautiful violet tinge.

Apamea basilinea. — One example without markings was secured.

Boarmia repandata. — The local form of this species, var. *sodorensium*, Weir, is well represented, and the specimens are unusually fine.

Odontopera bidentata. — The series obtained this year are an interesting lot. In colour they range through all gradations, from very pale ochreous to almost black. The markings in some specimens are exceedingly well defined, and in others obsolete.

Emmelesia albulata. — The var. *hebridium* was not seen in its true form, and only one example of the species captured this season approximated thereto.

Melanippe sociata var. *obscurata*. — Specimens of the second generation are tinged with ochreous, whilst those of the first generation are larger, darker in marking, and without any ochreous in the coloration.

Triphaena comes (*orbona*) occurs in all forms, including var. *curtisii*, whereas in Orkney only the latter form and its modifications have been obtained.

The collection, taken as a whole, is of greater value and interest than that brought back in 1887. We understand that the weather, from the beginning of May until the middle of June, was all that a collector could desire, but from the latter date up to the middle of July it was very unsettled. Sugar was not attractive, the only visitors being a few *Xylophasia monoglypha* (*polyodon*) and *Triphaena pronuba*.

VARIATION IN THE GENUS *EREBIA*.

BY GEOFFREY SMITH.

PART I.

(Continued from p. 281.)

We have seen that when a scheme of distribution is normal—i.e. when about the same number of individuals have values above the normal as below—then M, or the medium obtained by the scheme and the arithmetical mean of the values under observation are practically identical (see note, p. 280). So far, then, there is no apparent advantage gained by throwing the numbers in Tables I. and II. into the form of a scheme.

The advantage lies here: when it is stated that, for instance, ten individuals have 4 spots apiece; the mere numbers imply absolute identity between those ten individuals with regard to those spots. But this is never quite the case in nature; it would be giving a totally incorrect idea of the variations in the spots and ocelli of different species of *Erebia*, if hard and fast

lines were drawn between the various individuals of a species according as they had 0, 1, 2, 3, &c., spots. In order to give any idea of this variability, the relative sizes, distribution, &c., of those spots would have to be described. Now, this is done roughly by means of the scheme; when the statement that ten individuals have 4 spots apiece is transcribed into the scheme, all that is said about these individuals is that each one of them has a "spot-power" somewhere above 3 and up to 4—*e.g.* 3.1, 3.5, 3.7, &c. In this way the variations in size, &c., of the spots is taken into account, without actually measuring the individuals separately, except in so far as they have 0, 1, 2, 3, &c., spots of some kind.

How far it is possible to treat wing patterns in this manner can only be decided when actual data are considered; but it is obvious that in other characters, such as length of wing, weight, &c., the method is invaluable. For, instead of having to measure or weigh each individual accurately, convenient ordinal numbers are chosen, and the individuals are grouped according as they exceed or fall short of those numbers with regard to the character to be considered.

By means of this scheme, then, we are able to determine the M or mid-value of a group of individuals with regard to some character or other. The properties of this M are, besides its relation to the arithmetical mean—(1) the chance is an equal one of any previously unknown measure in the group exceeding or falling short of M; (2) the most probable value of any unknown measure in the group is M.

From these properties we gather that if individuals are selected *at random* from a group, the M of the smaller group so formed tends to remain the same as the original M of the whole group. In nature a chance selection must always be made, apart from natural or sexual selection, to determine which individuals shall breed: since these individuals in each generation will be selected according to the laws of chance, we may treat every generation as breeding in terms of its M.

In this way we bring our numbers under the light of the laws of chance, and it is under this light especially that it is intended here to bring the phenomena to be considered.

It is now time to answer an objection that will probably have occurred to the reader with regard to the discussion of fig. 1 on p. 279. It was there stated that if there were only a very few females, these would receive mates *by chance*, and so the equilibrium would be thrown out of order. But we have just seen that a selection of mates is always made *by chance*, and on this is based our system of dealing with the numbers; so that it would seem that in the case of the females being in a minority, there would be an equal chance of an equilibrium being established. But the word chance is used here in two different senses. In

the first case, where the females are in a great minority, only a very small selection of males is made for pairing, and the laws of chance cannot be applied to very small selections.

Make up, for instance, a pack of cards with 52 red and 26 black. The chances are then 2 to 1 on any card being red. Try to verify these chances, first by selecting at random 3 cards, and noting down their colours; repeat this process several times, putting back and shuffling the three cards after each draw. Then try with larger and larger selections in the same manner, and see which give the nearest result to the proportion 3 red to 1 black on the total number of draws. If this does not satisfy, the experiment may be tried with more complicated proportions. With more complicated proportions, larger draws are required, and so on. It is to a similar principle that a gambling establishment like Monticarlo owes its continued existence.

Some way back (p. 280) the principle was formulated that equality in the number of the sexes tended towards equilibrium, and that inequality tended towards fluctuation of characters. To illustrate this, an hypothetical case was taken (1) in which the males were variable and the females constant, the males being in excess. It is plain that several other conditions might occur. Thus (2) males variable, females constant, females in excess; (3) males constant, females variable, males in excess; (4) males constant, females variable, females in excess; (5) males variable, females variable, males in excess; (6) males variable, females variable, females in excess. By a little consideration it will be seen that conditions (2) and (3) are favourable to an equilibrium being established, and therefore do not fall in with the principle, and that (1), (4), (5), and (6) are conditions favourable to fluctuation. The second clause of the principle formulated must therefore be narrowed to the following—"and that inequality when coupled with variability in the preponderating sex tends towards fluctuation."

(To be continued.)

NOTES ON THE DIVISION VELIARIA [RHYNCHOTA]

(= SUBFAM. VELIDÆ, LETH. & SEV.)

BY G. W. KIRKALDY, F.E.S.

(Continued from p. 286.)

The following table of species is to some extent based upon Champion's table of Central American species; I have, however, seen specimens of most of the described species:—

- | | |
|--|----------------------------|
| 1. Posterior tibiæ with a long hook at the apex. | |
| [Posterior femora, moderately incrassate, dentate] . . . | 2 |
| 1 a. Posterior tibiæ without a hook | 4 |
| 2. Terminal genital segment mucronate | 1 <i>uncinata</i> , Champ. |

2a. Terminal genital segment not mucronate	3
3. Pronotum fuscous; legs moderately long	2 <i>elegans</i> , Uhler.
3a. Pronotum rufo-castaneous, legs shorter	3 <i>insularis</i> , Champ.
4. Posterior femora unarmed ♂ ♀	5
4a. Posterior femora dentate beneath ♂ ♀	6
5. Mesosternum with a strong, curved diagonal carina	4 <i>festæ</i> , Kirk.
5a. Mesosternum simple	5 <i>plumbea</i> , Uhler.
6. Posterior femora more or less incrassate (at least in the ♂)	7
6a. Posterior femora scarcely incrassate	20
7. Intermediate femora constricted medianly; posterior femora (♀) hollowed at the base, and dentate in their outer half; posterior tibiæ obsoletely denticulate	6 <i>spinigera</i> , Champ.
7a. Intermediate femora not constricted	8
8. Posterior femora greatly incrassate and dentate, posterior tibiæ conspicuously denticulate (♂)	9
8a. Posterior femora moderately incrassate and dentate, posterior tibiæ nearly straight and minutely denticulate (♂)	16
9. Posterior legs subelongate; tibiæ strongly sinuous (♂)	10
9a. Posterior tibiæ straight; armed with two long teeth (♂)	14
10. Anterior tibiæ not dilated (♂)	11
10a. Anterior tibiæ greatly dilated and excavate beneath (♂)	7 <i>collaris</i> (Burm.)
11. Posterior femora strongly incrassate and multidentate, posterior tibiæ armed with slightly longer teeth beyond the middle (♂)	8 <i>varipes</i> , Champ.
11a. Posterior femora enormously inflated and multidentate	12
12. Posterior trochanters with a long spine	9 <i>whitei</i> (Bredd.)
12a. Posterior trochanters obsoletely (or not) dentate	13
13. Ultimate segment of intermediate tarsi much longer than the second	10 <i>ravana</i> , sp. nov.
13a. Ultimate segment slightly longer than the second	11 <i>crassipes</i> , Champ.
14. Third segment of antennæ and the anterior tibiæ dilated (especially ♂)	12 <i>tayloriella</i> , Kirk.
14a. Third segment of antennæ and anterior tibiæ not dilated	15
15. Length more than 5 mill., a castaneous median longitudinal line (at least) on pronotum. Seventh segment of connexivum produced apically in acute spines	13 <i>reitteri</i> , Reuter.
15a. Length less than 4½ mill., pronotum unicolorous (except for transverse apical stripe). Connexivum not spinose	14 <i>femoralis</i> , Champ.
16. Posterior femora moderately incrassate (♂), slender (♀); entirely dark (except base of median tooth)	17
16a. Posterior femora moderately incrassate (♂ ♀); flavous at the base and beneath	18
17. Second segment of intermediate tarsi equal to third	15 <i>distincta</i> , Champ.
17a. Second segment one-fifth shorter than third	16 <i>peggia</i> , Kirk.

18. Second and third segments of intermediate tarsi sub-equal. (Pronotum in the macropterous form, apically spinose) 17 *armata* (Burm.)
- 18a. Third segment distinctly longer than second 19
19. More than three times as long as broad; (pronotum in macropterous form not spinose) ground colour of legs deep black 18 *nigricans* (Burm.)
- 19a. Less than two and a half times as long as broad; ground colour of legs fulvous 19 *salinus* (Champ.)
20. Second and third segments of intermediate tarsi sub-equal 20 *angustipes*, Uhl.
- 20a. Second segment much longer than third 21 *tenuipes*, Champ.

Species not included in the above table:—

- No. 22. *obesa*, Uhler.
 „ 23. *æneipes*, Haglund.
 „ 24. *infernalis* (Butler).
 „ 25. *trailii* (F. B. White).

(To be continued.)

NOTES AND OBSERVATIONS.

SECOND BROOD OF *EPINEPHELE IANIRA*. — With reference to Mr. Lucas's note on this subject (*ante*, p. 287), I am inclined to think that a late emergence of *Epinephele ianira* is the rule rather than the exception in the more sheltered parts of the south coast. Whether we are right in attributing it to the occurrence of a second brood is perhaps open to question, although I must say that such little evidence as is obtainable is favourable to that presumption. One is far too apt to omit from one's note-book all mention of a species generally regarded as "so common," and as a consequence reliable records regarding its times of appearance are few; but such casual notes as I have been able to turn up go to support my recollection that it has generally occurred fairly plentifully in the sheltered hollows under Beachy Head, where I have collected more or less regularly for many years well into the end of August. My first visit to that locality during the past summer was on August 19th; *E. ianira* was then flying commonly, and continued on the wing in varying abundance, according to the suitability of the weather, until I left the neighbourhood on September 15th; and a pair that I captured on the 8th of that month are in perfectly fresh condition—a fact, the full significance of which will be appreciated when it is mentioned that a strong gale swept the coast on the 3rd and 4th.—ROBT. ADKIN; Lewisham, October, 1901.

PTEROSTOMA PALPINA DOUBLE-BROODED — I do not think the appearance of a second brood of *P. palpina*, with full-sized imagines, can be so unusual, in the South of England, as Mr. A. J. Lawrance seems to think (*vide ante*, p. 288). Of the seventeen male specimens before me, collected from various sources, by far the largest one of all was taken

by myself in this neighbourhood on August 20th, 1892; whilst of the three next in point of size, one was captured at Seale, Surrey, by the Rev. C. R. Digby on August 23rd, 1892, and another in this neighbourhood by myself on August 24th, 1886. Curiously enough, these three August specimens are the only ones out of the seventeen males of which the actual dates of capture are known to me, and the two of them that fell to me are the only examples of *P. palpina* that I have ever taken. — EUSTACE R. BANKES; Norden, Corfe Castle, October 22nd.

Referring to Mr. A. J. Lawrance's note (*ante*, p. 288) on the appearance of a second brood of *P. palpina*, I may mention that I captured five perfect specimens of this moth at light between the 8th and 12th August last. These, I think, were undoubtedly specimens of a second brood. — PHILIP J. BARRAUD; Bushey Heath, Herts.

With reference to Mr. A. J. Lawrance's note in last month's 'Entomologist,' I beg to say that this species appears to be constantly double-brooded. In this neighbourhood I usually see full-grown larvæ at the end of June or beginning of July, and again in September, and whenever I breed it I always find it double-brooded. This was also my experience some years ago in Devonshire. It is a favourite species of mine, and I have bred great numbers of them at different times. — GERVASE F. MATHEW; Dovercourt, Essex, October 17th, 1901.

PACHYCNEMIA HIPPOCASTANARIA DOUBLE-BROODED. — In answer to Mr. Carr's query regarding a late emergence of *P. hippocastanaria* (*ante*, 288), I find, on reference to my note-books, that it occurred pretty freely on Shirley Heath, Surrey, in the seventies, both in April (the usual date being about the 20th of that month) and in August; also that from larvæ swept from heather in the same locality in September, I reared moths in the following January and February, and from others taken in the same way and place in June moths appeared in July, the pupæ in both cases being kept indoors in a fairly warm room. In later years I have met with the imago in some numbers at Oxshott both in April and August. As my notes extend over a number of years, I think the late brood cannot be regarded as in any way exceptional. — ROBERT ADKIN; Lewisham, October, 1901.

Perhaps my experience as to *P. hippocastanaria* being regularly double-brooded may be of interest to Mr. Carr and others. Before 1899 I cannot speak with certainty, as I did not at that time keep a diary of the occurrence of the more common species; but in both 1899 and 1900 I found it fairly abundant in July and the earlier part of August on our *Cribrum* heaths here whilst in search of *Selidosema ericetaria* and *Agrotis agathina*, their condition being on the whole very good. This year my collecting rambles did not take me in that quarter. Until Mr. Carr's note appeared on the subject, I had no idea it was at all uncommon for a second brood to occur. — FRED. G. BELLAMY; Ringwood, October 17th, 1901.

In reference to Mr. F. M. B. Carr's note as to a late brood of *P. hippocastanaria*, I took five specimens of this insect in excellent condition at Midhurst, Sussex, on July 22nd, 1901, by working the common after dark with an acetylene lamp. — ALFRED E. TONGE; "Glen Royd," Devon Crescent Road, Red Hill, October 5th, 1901.

ORTHOZIA RUFINA FLYING BY DAY.—On Sept. 18th last, while searching for *Celana haworthii* near Sheffield, I took three *Orthozia rufina*—one at 4.5, one at 4.20, and one at 5.30—and also saw another, which I was unable to catch. They were flying wildly over the heather, apparently never settling. I certainly did not disturb them. The weather was sunny, but rather windy. Has this habit been noticed before?—E. A. COCKAYNE; 6, Tapton House Road, Sheffield, September 23rd, 1901.

NEMEOPHILA (CHELONIA) PLANTAGINIS IN AUTUMN.—I have had several imagines of this species emerge during the past autumn. Is not this unusual?—G. E. J. CRALLAN; Bodorgan Manor, Bournemouth.

[Although we are not aware of any recent records of the fact, we believe that an autumn emergence of this species is not altogether unusual.—ED.]

ÆSCHNA CYANEA, &c., IN YORKSHIRE.—I must take exception to my friend Mr. W. J. Lucas's statement (*ante*, p. 290) that *Æ. juncea* is more of a northern insect than is *Æ. cyanea*. In my own experience in Yorkshire quite the reverse is the case. *Æ. cyanea* occurs all over the county, and in the proportion, I should say, of a least twenty to one as compared with *Æ. juncea*. *Libellula depressa* occurs in Yorkshire—at Scarborough, York, and other places. This year *L. quadrimaculata* occurred in plenty at Halifax.—Geo. T. PORRITT; Crosland Hall, near Huddersfield, October 11th, 1901.

THE LEPIDOPTEROUS FAUNA OF HAMPSHIRE.—Mr. Moberly has already pointed out (*ante*, p. 18) that the list published in the 'Victorian History: Hampshire,' vol. i. (1900) is "not quite exhaustive." I should like to make a few further additions. *Eupithecia succenturiata* and *E. subfulvata* are not infrequent at Sandown, and probably elsewhere in the Isle of Wight and on the mainland; and I have this year taken larvæ of *E. plumbeolata*, also at Sandown. *Melanippe unangulata* is there common, and I have twice taken *Tapinostola hellmanni* in localities some few miles apart, one on each side of the town; I have not yet discovered its headquarters, but it does not seem possible that the specimens were immigrants or accidentally introduced. *Mamestra abjecta* occurs both at Sandown and Freshwater. The omission of *Noctua flammata* and of *Heliothis armigera* is perhaps intentional, for it is well known that they have both occurred in the Isle of Wight. *Dyschorista suspecta* has once been taken (by my friend Mr. H. H. May), and I am under the impression I have heard of its common occurrence in the New Forest. There was a record of *Micra ostrina* for the Culver Downs, Isle of Wight, in an early volume of the 'Entomologist,' but I cannot at the moment lay my hand upon it, and cannot vouch for its authenticity. *Hypenodes albistrigalis* is, I believe, common in the New Forest, where I took it not infrequently in 1894; I have also taken it in Parkhurst Forest, Isle of Wight. *Orobena stramentalis*, *Spilodes palealis*, *Scoparia lineolea*, and *Homœosoma binarella* are all Sandown species, and the omission of *Scoparia mercurella* from the list must surely be an oversight. I have done so little systematic work amongst the smaller things that I refrain from carrying my list of additions further. I should like to add that I am collecting materials for working out in some detail the lepidopteron fauna of the Isle of Wight, and

shall value any assistance which may be rendered.—LOUIS B. PROUT ; 246, Richmond Road, N.E., October 8th, 1901.

ERRATUM.—Page 296, lines 11 and 12, for “*externalis*” read “*extimalis*.”

CAPTURES AND FIELD REPORTS.

SPHINX CONVULVULI IN 1901.

Berkshire.—I had two *S. convolvuli* brought me last month, both taken within a short distance of my house, and heard of several others having been taken.—W. E. BUTLER; Hayling House, Reading, Oct. 12th, 1901.

Three specimens of *S. convolvuli* were sent to me by a friend, who is one of the deacons at Wellington College, Berks, on Sept. 27th last, and another was seen at the same place a few days later.—CHAS. F. THORNEWILL; Calderhall Vicarage, Whitechurch, Salop, Oct. 18th, 1901.

Bucks.—A living pupa of *S. convolvuli* was dug up in a potato allotment near Haddenham on Sept. 19th last, and given to me. I ascertained that the wild convovulus (*Convolvulus arvensis*) was growing freely thereon.—W. H. BARTON; The Poplars, Spencer Road, Chiswick, Oct. 16th, 1901.

Cornwall.—On September 21st I took on the wing in my garden three specimens of *S. convolvuli*—two males and one female. I saw one other specimen, but failed to capture it. One male was in perfect condition, the others slightly damaged. The next evening, in torrents of rain (it had rained incessantly throughout the day), I walked around the garden and saw two more specimens on the wing, but climatic conditions were totally against an attempt at capture. On Sept. 23rd I captured a female example on the wing in perfect condition; on Sept. 27th another female, and on Oct. 2nd a male specimen—both of the latter being slightly damaged. Three other captures have been reported to me: one taken at rest on some coloured drapery hanging on a clothes-line outdoors; one on the wing, in the daytime, in a pigeon-house, probably having been disturbed or dislodged; and one flying in a bedroom in the twilight.—W. A. ROLLASON; The White House, Truro, October, 1901.

Devonshire.—When I was staying at Dawlish this year a nearly full-grown larva of *S. convolvuli* was brought to me on August 28th. It had been taken in a garden in the neighbourhood.—HUGH MAIN; Forest Gate, London, E., Oct. 16th, 1901.

Two fine specimens of *S. convolvuli* were captured in the town during the first week in August, and are now in the possession of Mr. H. E. Monk. Mr. J. Chichester, on Sept. 7th, gave me a perfect specimen, evidently freshly emerged, taken at the bloom of the tobacco plant at Grenofen. Of six insects seen he succeeded in taking two. He states that two years ago they were still more common.—(Rev.) W. J. LEIGH PHILLIPS; Tavistock.

Dorsetshire.—*S. convolvuli* was plentiful here during the month of August, and I secured a good number of very fair specimens; as usual, they were mostly taken at tobacco plants. During September they

were not so numerous, but in better condition, and I think some must have been bred here. I am induced to think this not only from their condition, but from the following facts. On June 2nd, whilst hunting for *Aciduliu degeneraria*, I disturbed and caught a male *S. convolvuli* in excellent condition. On August 2nd I had a larva of the insect brought me which had commenced to pupate, and which developed into a fine pupa. On Sept. 22nd a pupa was brought to me. Both larva and pupa had been dug up amongst potatoes. These pupæ are now quite lively, and I hope will develop into the perfect insect. The larva I had last year died in the pupa state.—Jno. T. HYDE; The Grove, Portland, October, 1901.

Essex.—Ten specimens of *S. convolvuli* were taken off the electric lamps here by Mr. Main and myself on Sept. 24th and 25th.—A. HARRISON; Forest Gate, London, E., Oct. 16th, 1901.

Hampshire.—As the larva of *S. convolvuli* seems to be so easily found, it may be of interest to add to the lately recorded captures another instance of its discovery. At the end of August (I have no note of the date) a full-fed larva was brought to me by a farmer who said that he found it amongst the stubble of an oat field. Bindweed was plentiful in the surrounding hedges. I did not allow the caterpillar to pupate, but preserved it for my collection. The moths of this species were very abundant here this year. On Sept. 9th I secured five at the flowers of *Nicotiana affinis*, and three on the following evening, but released four, as they were in bad condition. Several other specimens were sent to me by friends here, but were without exception too much damaged to be of any use. I also was told by many persons who have gardens that they had seen very large moths hovering over the flowers at dusk at the beginning of September.—ALBERT MAY; Hayling Island, Oct. 21st, 1901.

On Sept. 10th I found a fine freshly-emerged *S. convolvuli* at rest on an oak fence near Totland Bay. I have since found five more perfect specimens on fences here. Up to the time of writing over one hundred and eighty of these moths have been taken here. Besides, a friend of mine had five larvæ, and others had pupæ brought them which had been dug up in gardens, chiefly among potatoes.—G. E. J. CRALLAN; Bodorgan Manor, Bournemouth.

On October 1st a specimen of *S. convolvuli* was brought me, which had been caught at Botley station by Mr. C. Newman.—M. S. JENKINS; Botley, Hants.

Hertfordshire.—A specimen of *S. convolvuli* was captured in a neighbouring garden and brought to me on Sept. 25th last. It is in rather poor condition.—PHILIP J. BARRAUD; Bushey Heath, Herts.

Kent.—*S. convolvuli* and *Acherontia atropos* appear to be fairly numerous again in the southern counties this year. I can record five of the former for the Farnborough district, and three of the latter for Bromley Common.—A. J. LAWRENCE; Bromley Common, Kent, Oct. 4th, 1901.

On Sept. 22nd I captured a specimen of *S. convolvuli* as it was flying over tobacco bloom at Wellesborough, near Ashford, the locality in which I took several examples of this species in 1898. A worn specimen, taken by a gardener at Riversdale, Lewisham, was brought to me on Sept. 24th, and on the 25th of the same month, at 9.30 p.m.,

I saw a specimen hovering over tobacco flowers in the garden here.—D. CHITTENDEN; 98, Court Hill Road, Lewisham.

Middlesex.—On October 2nd I took a fine specimen of *S. convolvuli* at rest on a wall in the High Street.—T. H. L. GROSVENOR; Boundary House, Hadley, Middlesex, Oct. 14th, 1901.

I have to record the capture of a fine pair of *S. convolvuli* at light near here on Sept. 1st. Five other captures of this species in Hampstead and Highgate have come to my knowledge during the past three or four weeks.—L. A. SPENCER; 52, Burghley Road, Highgate Road, N.W., Oct. 22nd, 1901.

A fellow student gave me a specimen of *S. convolvuli* on Sept. 25th. It was found at rest on a gate-post at Isleworth.—GEO. B. WALCH; Borough Road New College, Spring Grove, Isleworth.

Somersetshire.—Between August 18th and October 10th we have taken fifteen specimens of *S. convolvuli*, all in the garden flying over the tobacco plant.—J. P. LAWSON; Southview, Princes Road, Clevedon, Somerset.

Suffolk.—While staying at Bury St. Edmunds recently, I was shown a specimen of *S. convolvuli* which had been taken in a house in the town about the beginning of September.—A. R. KIDNER; St. John's College, Cambridge, Oct. 1st, 1901.

My father picked up a fine specimen of *S. convolvuli* on a road close to the sea on Sept. 23rd at Aldeburgh, Suffolk.—J. C. WALKER; 41, Hamilton Terrace, N.W.

Judging from different reports, *S. convolvuli* has been unusually plentiful this year. Several specimens have been taken at Stretton, and they have been frequent visitors to the flowers of petunias and the sweet-smelling tobacco plant (*Nicotiana affinis*) in my garden during the month of September. Two or three other specimens which had been taken in the town have also been left at the museum.—CLAUDE A. PYETT; 28, Waterloo Road, Ipswich.

Worcestershire.—Three specimens of *S. convolvuli* were captured at Malvern the latter end of September.—W. EDWARDS; Malvern.

COLIAS EDUSA IN CORNWALL.—On May 17th last, I took, near St. Austell, a very fine male specimen of *C. edusa*. He was very strong in flight, and gave me a smart chase. This was presumably a hibernated specimen, and is the only one I have seen in this district for the year. But what I wish especially to comment upon is with reference to my note (Entom. xxxiii. p. 309) wherein I recorded a large capture of *C. edusa*, together with eleven of the beautiful female variety *helice*. This year I visited the same locality and at the same time, but without seeing a single specimen of either. This is all the more remarkable as the lucerne field in which I took such numbers last year had not been ploughed up or disturbed in any way, there being a fair quantity of blossoms still in the field, which was being grazed by sheep. The weather was in all respects similar. Of *Pyrameis cardui* I also took a fair number last year in the same field—this time they also were absent. Is there any probable explanation of these remarkable facts?—W. A. ROLLASON; The White House, Truro, October, 1901.

COLIAS EDUSA AND *C. HYALE* IN HAMPSHIRE.—Although both of these species were so abundant here last year, only one specimen of

each was seen by me during the last season; *C. hyale* (var. *pallida*), Aug. 20th; *C. edusa*, Sept. 6th.—ALBERT MAY; Hayling Island, Oct. 21st.

COLIAS HYALE IN KENT.—*C. hyale* has again put in an appearance. This year I captured six specimens, on August 25th, at Hither Green—four males and two females, one of the latter a white variety.—D. CHITTENDEN; 98, Court Hill Road, Lewisham, S.E.

COLIAS HYALE IN WILTSHIRE.—While at Wylde this year I took four specimens of *Colias hyale*, one a very perfect dwarf form. I missed a good many others. I also took two specimens of *C. hyale* near Wimborne, Dorset. I captured a good many specimens of this species in 1900 at Wylde.—R. V. SOLLY; 40, Southernhay, Exeter, Sept. 25th, 1901.

VANESSA ANTIOPA IN HAMPSHIRE.—While collecting on one of the large heaths to the north of this town on September 18th, I observed a large dark brown butterfly struggling against the north wind, which was blowing strongly. It proved to be a worn specimen of *Vanessa antiopa*.—G. E. J. CRALLAN; Bodorgan Manor, Bournemouth.

VANESSA ANTIOPA IN DEVONSHIRE.—A fine specimen of *V. antiopa* was seen in a garden here on September 20th by Mr. H. Kerslake. It was feeding on a decayed apple, but unfortunately it escaped capture. A Newton College boy was more fortunate on Dartmoor last month.—(Rev.) W. J. LEIGH PHILLIPS; Tavistock.

VANESSA ANTIOPA AT EPSOM.—A specimen was caught by Mr. Gurth Edelsten in the garden of Mead House, Epsom, Sept. 9th, 1901.

VANESSA ANTIOPA IN THE NORTH OF LONDON.—I came across a fine specimen of *V. antiopa* (Camberwell Beauty) on August 25th in the North of London. Should you care to have further particulars, I shall be happy to give you any information and corroboration you may require, as I was with three other men at the time.—A. PODMORE; 2, Palace Road, Streatham Hill, August 27th, 1901.

[We wrote to our correspondent asking for more precise information as to locality, but so far we have not been favoured with a reply.—ED.]

VANESSA POLYCHLOROS, &C., IN LONDON.—On July 19th I captured a freshly emerged specimen with my hat as it was sitting on parapet of the railway at Abbey Street, Bermondsey, S.E. I believe that it was bred near there, as my son took one last year on July 21st close to South Bermondsey Station. I also noticed several *Lycana argiolus* flying in the Court Hill Road, Lewisham, and in my garden, as last year, at the end of April, and one or two of the second brood were also seen.—D. CHITTENDEN; 98, Court Hill Road, Lewisham.

HYBERNATION OF VANESSIDÆ.—A specimen of *Vanessa urticae* took up its winter quarters, on July 22nd, on the ceiling of the bath room, which contains a hot-water cylinder, and faces west, and is always warm. At the same time there were many colonies of young larvae from this same brood which in due time would produce butterflies which would naturally hibernate; but why should some individuals hibernate so early in the year?—(Rev.) C. A. SLADEN; Burton Vicarage, Chester.

EUGONIA AUTUMNARIA AT DOVERCOURT.—The morning of the 4th instant was dull and mild, with a south-westerly breeze, and a steady drizzle until 2 p.m, when it cleared off, and the wind went round to the north-east. Just before dusk I sugared some trees and twigs in hedges by the side of the road near my house, and at nine o'clock went out to see the result. It was then fine, bright, and cold, and the north-easterly breeze had freshened considerably, and I was not surprised that only two visitors came to my sugar—*Anchoecelis pistacina* and *Catocala nupta*; but while I was examining one of the trees I caught sight of a moth clinging to the under side of some autumn-tinted elm trees. It was a "thorn," much the colour of its surroundings, and was very quiet and allowed me to box it. I thought it was *Eugonia quercinaria* or *E. alniaria*, but next morning when I looked into the box I found it was a female *E. autumnaria*. This is the first time I have met with this (formerly rare) species, and I wonder if it is a native, an immigrant, or an escape? It is smaller than any of the females I possess—and I have a good series—so I fancy it may be the offspring of inter-bred parents. I kept her for several days, and she deposited about a hundred eggs, which appear to be fertile, as they have changed colour.—GERVASE F. MATHEW; Dovercourt, Oct. 17th, 1901.

ENISTIS QUADRA IN IRELAND.—With reference to the occurrence of (*Enistis quadra* in Ireland, the following record may be of some use. On July 26th I took a damaged female specimen in a house at Nenagh, Co. Tipperary.—F. W. J. JACKSON; 2, Vicarage Gate, Kensington, W., Oct. 1st, 1901.

HADENA GENISTÆ AT CHICHESTER.—Several specimens of *Hadena genistæ* were taken at sugar during June last by Mrs. Fogden, of Ryman's Tower, Apuldrum. I have not had time to refer to our local list of Lepidoptera, but I believe that this is an addition to it.—JOSEPH ANDERSON.

PLUSIA MONETA AT CAMBRIDGE.—On July 6th I took a specimen of *Plusia moneta*, settled on a gas-lamp, in St. John's College, Cambridge, almost in the same spot as the one recorded last year.—A. R. KIDNER; St. John's College, Cambridge, Oct. 1st, 1901.

CARADRINA AMBIGUA AT RINGWOOD.—Last year I took this species in scores upon flowers of *Clematis* here in my garden, and left plenty; this season I have only seen seven in all. Is *ambigua* going to die out, or, at least, has it found its level, and in future will be scarce again? Fresh importations of plant and insect life, although often prolific for a time, do sometimes die out, or barely exist in a new locality. It would be interesting to hear if this species has been scarce in other localities also.—J. HY. FOWLER; Ringwood.

ACHERONTIA ATROPOS LARVÆ: A VARIETY.—On Aug. 20th a gardener here sent me two larvæ of *A. atropos*; one was a full-grown specimen of typical appearance, the other differed from it immensely, answering the description of the variety given by Morris in the 5th (1896) edition of his 'History of British Moths'—"Sometimes the caterpillar is olive-brown, whitish in front, and the stripes darker." In my larva the stripes were very dark brown, and the whitish patches in front well

marked and distinct. I killed and preserved it, and the gardener told me that when he found those two larvæ in a potato patch he trod on a second larva like the dark variety, and killed it. Subsequently from a distant part of the island another larva with the same peculiarities was brought to me. I tried to rear it, but it died.—ALBERT MAY; Hayling Island, Oct. 21st, 1901.

ACHERONTIA ATROPOS IN CORNWALL.—I have a very fine specimen of *A. atropos*, 5½ in. across wing-tips, found on October 16th. It was taken in a street in the city, where there is considerable traffic, at rest on the curbstone, and where it was attracting considerable attention. When touched it several times uttered the shrill squeaking sound peculiar to this insect, and repeated same when placed in a box at home.—W. A. ROLLASON; The White House, Truro, Oct. 19th, 1901.

ACHERONTIA ATROPOS IN SUSSEX.—I have just set a fine female specimen, which was taken at rest on a fence at Worthing. I also received a larva from the same town.—A. J. LAWRENCE; Bromley Common, Kent, Oct. 4th, 1901.

ACHERONTIA ATROPOS IN YORKSHIRE.—On August 17th I captured a full-grown larva of *A. atropos* in a garden near the middle of Hull. Practically the only plants were nasturtiums and stocks. Can it have fed on either of these? It could not have come from a neighbouring garden, as we are cut off by high walls from the nearest of them. It pupated on the 27th, but the imago has not yet emerged.—GEO. B. WALSH; Borough Road New College, Spring Grove, Isleworth, Sept. 25th, 1901.

CHÆROCAMPA CELERIO IN WILTSHIRE.—I had this morning sent me by post a specimen of *Chærocampa celerio* from Wylve, Wiltshire. It was sent me in a cardboard box, was quite relaxed, and consequently had not been long dead, but was unfortunately a good deal rubbed. I may mention that I spent three weeks at Wylve in August, and that it was my landlord who sent me this insect.—R. V. SOLLY; 40, Southernhay, Exeter, Sept. 25th, 1901.

BUTTERFLIES IN THANET.—Acting upon the "tip" of a school-boy (see *ante*, p. 23), I went in search of *Aporia crataegi* early in July, and captured six specimens, one male and five females. They were easily detected from ordinary whites, and not difficult to catch, and, as they were scattered as far as two miles apart from first to last, it is satisfactory to find there is a possibility of this species getting commoner here. On Sunday, August 18th, I had the pleasure of seeing a specimen of *Pieris daphidice* on the wing, close to Dane Park. Having no net with me, I was obliged to use my hands, and I was lucky enough to catch it, as it settled quietly on a lucerne flower. It is a male in good condition. On the wing it resembled a female *Euchloë cardamines*, but its flight was weaker, and in no way could it be mistaken for an ordinary white. During the spring and early summer I have searched without success for the "clouded yellows" in every stage. On August 9th the first specimen of *Colias hyale* appeared, a lovely male in perfect condition; on the 10th, another fresh male; 12th, two ditto; 14th, seven specimens, including one female; 16th, twelve specimens

(three females). Since then it has been common on sunny days, but has rapidly deteriorated in condition; yesterday I took eight specimens, but only two were fit to keep, both fresh males. Having over a mile of lucerne close at hand, I can readily watch this species, and have walked round on most fine sunny days. So far, *Colias edusa* is very scarce, the first specimen, a fresh male, was captured on Aug. 16th, and no other put in an appearance until yesterday (Sept. 10th). This I missed, but it is not yet too late. The Vanessids have been remarkably scarce; of *Pyrameis cardui* I have not seen more than six; *Vanessa polychloros*, bred two; *V. urticae*, a few only; *V. io*, none (this is always scarce in Thanet); *P. atalanta*, one fresh specimen seen yesterday (hybernated specimens of *P. atalanta*, *V. urticae*, and *V. cardui* were of course seen earlier); apparently hot summers do not suit the Vanessids here. *Lycæna argiolus*, first seen on May 1st, and has been here more or less—in condition, good, bad and indifferent—ever since. *L. agestis*, commoner than usual, and has been taken in the park. *Thecla betulæ*, I beat eight larvæ from one sloe bush, but could not find it anywhere else. *Melanargia galatea*, same as *L. agestis*. Fritillaries are unknown, for *Argynnis latonia* has not yet turned up. — J. P. BARRETT; 3, St. John's Villas, Margate, September, 1901.

NOTES FROM DEVON AND NORTH SOMERSET.—As we do not get very many notes from North Somerset, perhaps the following may prove of some interest. I have been staying at Porlock, almost on the borders of Devonshire (August 9th to 19th). Of course, the time of year is not a very good one, or I should undoubtedly have worked harder and done much better. The place is surrounded by moorland hills, on which heath, ling, and bilberry grow in profusion. A good idea of the country can be got from 'Lorna Doone,' which deals with these parts. August 13th and 14th were spent at the now famous Dawlish (South Devon), and very bad weather was unfortunately experienced there. The attraction was, of course, *Cullinomorpha hera*, but the weather was so boisterous that I only succeeded in catching one specimen, and that was at dusk. August 14th was spent searching for *Bryophila glandifera* (*muralis*) in a terrific storm of wind and rain. One example and a thorough soaking were the result. The following species were also noticed at Dawlish:—*Pieris brassicæ*, *P. rapæ*, *Epinephele tithonus*, *E. ianira*, *Miana furuncula*, *Bryophila perla*, *Rumia cratægata*, *Crocallis elingvaria*, *Melanippe fluctuata*, *M. galinta*, *M. subtristata*, *Melanthia ocellata*, *Camptogramma bilineata*, *Coremia* (? *uniditaria*), *Acidalia marginipunctata*, *A. aversata*, *Abraxas grossulariata*, *Eubolia bipunctata*, *E. mensuraria*, *Botys asinalis* (very local), *B. ruralis*, *Pyralis farinalis*, *Herminia deviralis*, and *Pionca forficilis*. Rather a miserable lot for such a celebrated place, but, no doubt, owing to weather and want of knowledge of the locality. August 16th was spent at Lynton and Lynmouth (North Devon), but this was more for the purpose of seeing the beautiful scenery than of collecting. *Epinephele tithonus* and *E. ianira* were, of course, seen; also a single specimen of *Macroglossa stellatarum*, in the gardens of the Tors hotel. A few *Melanippe galinta* were disturbed, and I also found a spot for *Larentia olivata*, which were in grand condition, but at the time I was, unfortunately, netless. *Botys asinalis* occurred in the same spot. The rest of my collecting

was done chiefly between Porlock and the Doone Valley, and was confined almost entirely to day-work. Of the butterflies, one example of *Colias hyale* was seen on the moors. *Pieris brassica*, *P. rapæ*, and *P. napi* were all fairly common. A few *Argynnis* (*Dryas*) *paphia* were noticed, in a somewhat worn condition. *Satyrus semele* was abundant on the moors, and *Pararge megara* seemed to occur in great numbers almost everywhere, but only two specimens of *P. egeria* were observed. *Epinephele tithonus* and *E. ianira* abundant. *Vanessa urtica* was also very common, and a single example of *V. ia* was seen at Dunster (Somerset). *Lycæna icarus*, *Cyaniris argiolus*, *Polyommatus phlæas*, *Thecla quercus* (one), *Cænonympha pamphilus*, and *Pamphila linea* (*thaumas*), complete the list of butterflies. Turning to the moths, a single *Macroglossa stellatarum* was seen on the moor. A few *Apania oclea* and *Triphæna ianthina* turned up, and single examples of *T. jimbria*, *T. comes*, *Abrostola triplasia* (to light), and *Plusia gamma*. Geometers were rather better represented, the following species being observed:—*Ephyra porata* (one), *Camptogramma bilineata*, *Hypsipetes elutata* (worn), *Larentia didymata* (found at rest in the day-time on rough stone walls and banks, and flying abundantly over the whortleberry at sunset), *Rumia cratagata*, *Cidaria truncata* (a very nice lot, containing some very pretty forms, beaten from a place about two hundred and fifty yards long, where the whortleberry grew very thickly under a beech hedge), *C. populata* (obtained from the same lot of *Vaccinium* as *C. truncata*), *C. testata* (a few turned up in a sheltered corner of the moor), *Boarmia rhomboidaria* (a large and worn female), *Melanippe galiata* (not common), *M. subtristata*, *Melanthia ocellata*, *Acidulia aversata*, *A. marginipunctata* (a few very nice grey forms found at rest on rough grey stone walls, and differing considerably from some just taken in Kent). *Hypena proboscidalis* (worn) and *Botys ruralis* complete the list of imagines. Larvæ taken were:—*Euchelia jacobææ* (common), *Dasychira pudibunda* (one), *Spilosoma menthastri*, *Demas coryli* (common), *Lophopteryx camelina* (a few), *Amphidasys betularia*, and *Eupithecia nanata* (one). With regard to *Demas coryli*, I did not discover their presence till just before leaving. From the low beech hedges on the moor I then beat over fifty larvæ in an hour and a half. They varied considerably in size and colour—dark greyish, white, yellowish, and pink. One larva of *L. camelina* was red; although I have frequently taken the larva, I have never seen one of this colour before. Dragonflies were practically nil, *Sympetrum striolatum* alone being seen.—F. M. B. CARR; 46, Handen Road, Lee, S.E.

SPHINGIDÆ AT RINGWOOD.—Larvæ of *Acherontia atropos* were abundant last year, but this season they appear to have been more so, nearly every potato patch producing them. I obtained my first, a full-fed one, on Aug. 8th, and the last on Oct. 5th. The latter was wandering about in search of food; it was very small indeed, but has pupated. I have had pupæ brought to me right up to Oct. 11th, when a digger brought three which he turned up on that date. On Sept. 15th a pupa was brought to me; this was dark in colour, and a fine male imago emerged from it on the 17th; the pupa, upon being touched, squeaked several times, but not so loud as the imago did after emergence. I have specimens hatching out almost daily now in my

breeding-pan; I keep the pupæ very moist and warm upon a layer of earth. On Sept. 17th I had the pleasure of taking a fine female *A. atropos* which was settled upon a potato-stem; a neighbour discovered and kindly directed me to it. Doubtless if the fields where it occurs were carefully searched, a number might be found about this date. *Sphinx convolvuli* has also turned up commonly. I had larvæ, pupæ and imago, all at the same time alive; the imago was plentiful from Aug. 16th to the end of the month; they were nearly all females, and worn. I tried to obtain ova, but without result, and upon opening them I discovered they had already deposited; still there appeared to be a mass of soft ova in one or two examples. Up to Sept. 18th many were seen, in fact scarcely a night passed with a blank. Afterwards they were less plentiful, but suddenly, during the first week of October, I netted four perfectly good males, which were undoubtedly British born, and since Oct. 7th I have not seen any more, as the nights have been frosty. From Sept. 6th to 20th I had two larvæ and two pupæ brought to me, and one pupa dug by myself. Two imagines emerged on Oct. 3rd, another on the 14th; one pupa died, which I am keeping, and a larva died in changing. No doubt I could have obtained more larvæ had I discovered earlier that they were to be found. From the above notes I should say the life-histories of both species are identical. I had each alive in three distinct stages. Specimens of each were also reared without forcing. It will be interesting if *S. convolvuli* survives our winter, and is to be found about July next year; if so, larvæ should be found commonly during August and September. *S. ligustri* and *Smerinthus ocellatus* have been especially plentiful in the larval stage.—J. HY. FOWLER; Ringwood, Hants, Oct. 16th, 1901.

NOTES FROM ILFORD, &c.—*Acherontia atropos*, larva found leaving potato plot, Aug. 28th, 1901; pupated by Sept. 5th. *Sphinx convolvuli*, perfect imago found on a fence at mid-day, Sept. 21st, 1901. *Smerinthus ocellatus*, *S. populi*, and *S. tiliæ*, larvæ recently taken and now pupated. *Charocampa elpenor*, larva found in 1900. *Macroglossa stellatarum*, very numerous in 1900. *Lycæna argiolus*, several taken, 1901; also two seen on the wing, July 12th, in Ebury Street, Pimlico; several also seen, July 19th, at Belvedere, Kent.—JOSEPH ADAMS; 38, Empress Avenue, Cranbrook Park, Ilford, Essex, Sept. 21st, 1901.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—October 2nd, 1901.—The Rev. Canon W. W. Fowler, President, in the chair. Mr. G. C. Champion exhibited a long series of *Buprestis sanguinea*, Fabr., from Albarracin, Spain, showing the remarkable dimorphism of this species. — Mr. H. St. J. Donisthorpe exhibited, on behalf of the Rev. H. S. Gorham, of Shirley Warren, a specimen of the scarce beetle, *Hister marginatus*. Mr. Champion remarked that the species had been taken by Mr. Harwood, of Colchester. He also exhibited a number of rare Coleoptera from the New Forest—(a) *Velleius dilatatus*, F., twelve specimens, ten from one hornets' nest in August, and the other two from two other

nests, caught in specially constructed traps, the largest male reaching the abnormal size of 32 mm.; (b) *Anthaxia nitidula*, L., twelve specimens taken in July, one being of bluish colour; (c) *Agrilus sinuatus*, Ol., one of several which escaped—a beetle not taken for many years; (d) *Agrilis viridis*, L., a series from sallows in August; (e) *Platydemia violaceum*, F., five specimens—a species also not recorded recently; (f) *Collydium elongatum*, F., one specimen taken in the burrows of *Melasis buprestoides*, and another in the burrows of *Scolytus intricatus*. Mr. Champion said that *Platydemia* had been taken twenty years ago by Harris, while Mr. George Lewis associated *Velleius* with *Cossus*, and not with hornets.—Mr. C. P. Pickett exhibited a long series of *Lycæna corydon* taken during August, 1901, at Dover, varieties and aberrations, including two females with upper wings wholly blue, dwarfs no larger than *L. minima*, and others (males) with under sides devoid of spots. He also exhibited a series of *Angerona prunaria* (bred June and July, 1901), the results of four years' interbreeding, the colouration ranging, in the females, from bright yellow with no bands to very dark with deep chocolate bands, and in the males from plain intense orange with no bands to deep chocolate with bands, while one male assumed the coloration of the female.—Prof. T. Hudson Beare exhibited a specimen of *Medon castaneus*, Grav., taken in a water net on April 22nd, 1901, at the edge of a pond in Richmond Park, having evidently come off the long grass growing at the edge of the water. Very few observations of this beetle have been recorded, and they all seem, as in this case, to have been chance captures, its habits being unknown.—Mr. A. Harrison exhibited a series of *Amphidasys betularia* bred from parents taken in the New Forest in 1900, including twenty males and thirty-nine females, and six gynandromorphous specimens, out of seven bred, one being a cripple. The larvæ when first hatched were kept indoors, but were afterwards sleeved on birch when a few days old. Mr. Tutt said it was very remarkable that so many gynandromorphous specimens should have been secured from a single brood. There appeared to be frequently modification in the sexual organs corresponding with external variation of the secondary sexual characters. Mr. Merrifield remarked that the proportion of gynandromorphous forms in hybrid specimens was always much larger. — Mr. C. J. Gahan exhibited a male specimen of *Thamnotrizon cinereus*, L., one of the long-horned grasshoppers taken by Mr. F. W. Terry at Morden, near Wimbledon. He called attention to a very interesting abnormality displayed by the specimen in possessing two pairs of auditory organs instead of a single pair, the second pair being situated on the tibiæ of the middle legs in a position corresponding with that of the normal pair on the fore legs. —Mr. F. Merrifield exhibited a series of *O. antiqua* bred from pupæ placed in a refrigerator five weeks and then exposed to a mean temperature of 48° Fahr. Specimens thus treated were much darker than types of those occurring in a natural state, some approaching in depth of colouring to *O. gonostigma*. He also exhibited for comparison specimens from Sutherlandshire, lent by Mr. C. G. Barrett, none of them, however, comparable in darkness to those obtained by his experiment; and others from the collections of Mr. A. Bacet (including four of the American species) and Mr. L. B. Prout. Mr. Tutt said that the limits of variation in our own form were little known, and the most northern

examples, though the largest, were decidedly not the darkest. — Mr. R. South communicated a paper by the late Mr. J. H. Leech, B.A., entitled "*Lepidoptera-Heterocera* from China, Japan, and Corea (*Pyralidæ*)."

— Mr. G. C. Champion contributed "Notes and Observations upon the Sexual Dimorphism of *Buprestis sanguinea*." — H. ROWLAND BROWN, *Hon. Sec.*

SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—*July 25th, 1901.* — Mr. A. Harrison, F.L.S., in the chair. — Mr. Kemp exhibited species of *Coleoptera* taken in the New Forest at the end of June, including *Donacia crassipes*, *D. versicolore*, *D. sericea*, *Strangalia nigra*, *Asemum striatum*, *Anoplodera sexguttata*, *Leipus nebulosus*, and *Coccinella sedecim-guttata*. — Mr. Adkin, a bred series of *Lobophora polycommata* from larvæ taken near Brighton. — Mr. Step, living larvæ of a species of *Cassida* found feeding on hemp-nettle (*Galeopsis tetrahit*) on Wisley Common, Surrey. — Mr. Turner, larvæ of *Macroglossa stellatarum* from Bromley, Kent; they were of three forms, (1) delicate pink, (2) green with white lines, (3) very dark olive, almost black. — Mr. Edwards, several species of *Papilio*, including *Papilio agestilus*, *P. archisilans*, *P. paris*, *P. cressphontes*, *P. paon*, *P. marcellus* and var. *walshii*, and *P. asiaticus*. — Messrs. Harrison and Main, a fine bred series of *Geometra papilionaria*, and a series of well-marked *Tephrosia biundularia* var. *delamerensis*, both from Delamere Forest. — Mr. Edwards, a box of insects just received from Bucharest, including examples of *Libellula quadrimaculata*, *Platetrum depressum*, and *Centrotus cornutus*. — Mr. Enock, bred series of the dragonflies *Anax imperator*, *Cordulia ænea*, and *Brachytron pratense*, the two former from Esher and the latter from Wisley.

August 8th. — H. S. Fremlin, Esq., President, in the chair. — Mr. R. Adkin exhibited a bred series of *Geometra papilionaria* from Bexley, Kent, and noted the sensitiveness of its colour, explaining his method of preservation, stupefying with cyanide and killing with oxalic acid. Mr. Main said that he and Mr. Harrison had used chloroform as the stupefying agent with even greater success. — Mr. Manger, a large light coloured *Sphinx ligustri* from Brockley, and a male of the dragonfly *Æschna cyanea*, taken in his garden at New Cross. — Mr. Hy. J. Turner, a pupa of *Macroglossa stellatarum* from Bromley, showing the curious beak, and a short bred series of *Agrotis ripe*, from Dawlish, and referred to the marked difference in shape between the males and females. — Mr. Step, *Cassida equestis* bred from the larvæ exhibited at a previous meeting, stating that they pupated about July 25th, and emerged about July 31st. — Mr. Fremlin, a number of gall excrescences on the twigs of hornbeam, which had been produced by a species of *Aphis*. — Mr. Edwards, a number of rose-leaves disfigured by a carpenter bee. A discussion took place as to the selection of leaves of particular shrubs, and the shapes of the pieces cut out. Mr. Turner stated that they regularly burrowed in the soil in the cactus-pots in his greenhouse. — Rev. H. Wood, two spiders, *Theridion lineatum*, females with egg-cocoons. The living specimen had killed the preserved one and appropriated its egg-case, fixing them both together on the lid of the tin. — Mr. Step read the Report of the Field Meeting held at Mickleham on June 22nd, which was attended by forty members.

August 22nd.—Mr. F. Noad Clark, Vice-President, in the chair.—Dr. Chapman exhibited a larva of *Grællsia isabellæ* from Spain, the only European species of the Attacinae group of the Saturniidae, and pointed out the protective nature of its colour resemblance to the twigs of its food, Scotch fir.—Mr. F. H. Day, local and rare Coleoptera from Carlisle, including *Donacia discolor* of all shades and variation; *Hydrothassa hanoverana*, eighteen specimens by sweeping *Caltha palustris*; *Bradycellus collaris*; *Sphærites glabratus*, one of two specimens taken in carrion and very rare; *Telephorus abdominalis*, found among bracken; *T. darwinianus*; *Rhynchites cupreus* from mountain ash; and *Agabus arcticus*, one of the rarest British Agabi.—Mr. Enock, a pair of *Orthetrum cancellatum*, captured in cop., at Wisley on July 20th; the female was of the same blue colour as the male.

September 12th.—Mr. W. Lucas, B.A., Vice-President, in the chair.—Mr. South exhibited two specimens of the "buff variety" of *Amphidasys betularia*, type form; and a buff variety of var. *doubledayaria*. The latter specimen was bred, with several similar examples, by Mr. John Taylor, of Oldham, some years ago. He remarked that Mr. Taylor had informed him, in reply to a direct question on the point, that "the larvæ, pupæ, and imagines of buff *betularia* were never in any place where they would be subject to the influence of chlorine vapour, or anything that might tend to change their colour."—Dr. Chapman, a much suffused black var. of an *Argynnis* sp. from Spain; in shape it was *A. aglaia*, but the under side was marked like *A. adippe*.—Mr. Lucas, for Mr. H. E. Annett, a var. of *Epinephele hyperanthus*, from Oxshott, nearly approaching var. *arete*; a male specimen of the large earwig, *Labidura riparia*, taken by Major Robertson in Pokesdown, Aug. 1900; and coloured drawings of (1) *Argynnis paphia*, male, a pale yellow var.; (2) *Epinephele tithonus*, female, a xanthic var.; both from specimens taken in the New Forest.—Mr. Kirkaldy, numerous species of Miridæ = Capsidæ, of the genera (1) *Orectodorus*, most of which are ant-mimics, and (2) *Resthenia*.—Mr. West, of Greenwich, long series of three closely allied and obscure species of Homoptera—*Acocephalus brunneo-bifasciatus* and *A. flavo-striatus*, both from roots of grass on waste land at Catford, and *A. albifrons*, under furze bushes, Blackheath.—Mr. Kemp, living nymphs of the Odonata. *Sympetrum striolatum*, *Gomphus vulgatissimus*, and *Calopteryx virgo*, all from the New Forest.—Mr. Edwards, some remarkable pendant galls on the under side of a leaf of a shrub, *Machilus duthiei*, from North-west India.—HY. J. TURNER, Hon. Rep. Sec.

BIRMINGHAM ENTOMOLOGICAL SOCIETY.—July 15th, 1901.—Mr. H. Willoughby Ellis, Vice-President, in the chair.—Mr. J. T. Fountain showed a series of *Tæniocampa instabilis*, to illustrate its wide range of variation.—Mr. A. H. Martineau, *Bombylius*, sp. = *canescens*? from West Malvern.—Mr. H. Willoughby Ellis, in illustration of his paper, the following Coleoptera; *Metæcus paradoxus*, *Aleochara fuscipes*, *Homalota trinotata*, *Xantholinus linearis*, *Cryptophagus pubescens*, and *Anthicus floralis*.—Mr. Ellis read, for Mr. H. St. John K. Donisthorpe, a paper entitled "All that is known of *Metæcus paradoxus*," in which an account was given of its extraordinary life-history, &c.—COLBRAN J. WAINWRIGHT, Hon. Sec.

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LIFE-HISTORY OF *HESPERIA COMMA*.

By F. W. FROHAWK, F.E.S., M.B.O.U.

As I believe that this species has hitherto never been successfully reared from the egg, the following life-history may be of some interest to those who may have a desire to rear this interesting butterfly. On August 17th, 1900, I found a few *Hesperia comma* on the wing over a small patch of chalky ground covered with a short dense growth of various grasses (but the fine hair-grass predominating), rock-rose, thyme, &c., and soon detected one (a female) hovering close over the plants, so by carefully watching it I saw her settle on a tuft of hair-grass (*Aira cæspitosa*), and after walking over and among it a little time, she curved her abdomen down and deposited a single egg on one of the fine hair-like blades, or rather spines, and close by, within an inch, I found another egg, similarly laid, which, from its darker colouring, I should suppose had been deposited about three or four days previously. After securing these two eggs, I dug up the plant of grass as well as other similar plants for potting, and then captured a few females, which I subsequently placed on the plants, and on August 20th they deposited a large number of eggs upon the grass-stems and blades.

The egg is very large in proportion to the butterfly, measuring $\frac{1}{2}\frac{1}{8}$ in. in diameter at the base; in shape it exactly resembles an inverted pudding-basin, having a sunken crown, rounded sides, and a well-developed basal rim; the base is quite flat; the surface is finely granulated, forming reticulations near the base which run into ridges to the rim; when first laid the colour is pearl-white with the slightest yellowish-green tinge, which very gradually turns deeper in colour, assuming a pale straw-yellow on the sixth day, and when a fortnight old it is a clear pale apricot yellow, which colour it remains until the middle of January, when a slight change begins to take place by the

colouring gradually fading until it finally turns to an opaque white with the faintest yellowish hue at the base and rather leaden in certain lights on the crown. It remains unchanged during February and March; at the end of the latter month, or the first few days of April, it hatches. After hatching, the shell is a dull opaque white.

On April 1st, 1901, the eggs began hatching; nearly all were hatched by the end of the first week in that month. The larva eats a circular hole in the crown of the egg, through which it emerges. Directly after emerging it measures $\frac{1}{12}$ in. long; the head is proportionately large, the body swollen at the middle, attenuated at both ends but mostly so on the first segment, which is furnished with a dark-brown shining collar; it is wrinkled transversely and lobed laterally; the entire body is a rich deep straw-yellow, which becomes paler after feeding; on each side are four longitudinal rows of very minute knobbed points, all of about equal size; the first and second rows are dorsal and subdorsal, the third and fourth are super-spiracular and sub-spiracular; excepting those forming the latter row, all the points are directed forwards, those on the anal segment are longer and only slightly clubbed; along the lateral region, including the claspers, are a number of minute spines pointing downwards; all the points and spines are white and glassy with dark bases; the entire surface is granular; the head shining black, granulated, and bears a number of tiny whitish spines; the mouth-parts are brown; the legs and claspers the same colour as the body. If the young larva is in any way disturbed, however slightly, it immediately contracts and rolls itself up with the head touching the eighth segment, and remains motionless for several minutes. It does not eat the empty egg-shell, but directly after leaving the egg it starts spinning the fine grass together into a somewhat dense cluster an inch or two above the ground. In this compact shelter the larva lives and feeds upon the grass surrounding it, remaining almost always completely hidden. Sometimes as many as three or four live together. It appears to be chiefly nocturnal, as I have always found them quietly resting during the day, and exceedingly difficult to see, as they are so well hidden. The first stage lasts for about one month.

On May 2nd I found many of the larvæ had recently moulted for the first time. Just before first moult it measures $\frac{1}{8}$ in. long, the colour being the same as when first hatched. Soon after first moult the colour along the dorsal surface has a decidedly greenish tinge; the rest of the body is pale straw-yellow. It is more thickly sprinkled with minute white glassy angulated knobbed points with black bases; and on the dorsal surface of each segment are two shining black spiracular-like rings, and another just above the true spiracle; also on the second and

third segments are two larger ones precisely like spiracles; all these, as well as the spiracles, are black. The head is similar to previous stage. The first segment, which is freely retractile, has the anterior half of a lilac-flesh colour, which is the elastic portion, the posterior half having a shining black band encircling the upper half. On May 21st all the larvæ still in the second stage.

Upon examining the larvæ on May 28th I found several had just moulted the second time, and others undergoing the moult, and some of similar size but not yet moulting. The second stage lasts between three and four weeks. Shortly before second moult it measures $\frac{7}{8}$ in. long. The anterior segments, especially the first, are much smaller than the rest of the body, being considerably swollen about the middle; the anal segment has the dorsal surface speckled with brown. As in the first stage, they live entirely concealed in the tubes of grass spun closely together. They crawl rapidly either forwards or backwards, similar to other case-dwellers, and feed on any species of grass that happens to be interwoven with the hair-grass.

On June 14th I again examined them, and found over two dozen larvæ in different stages; some after the second moult, and others after the third moult, but varying greatly in size.

After second moult, and shortly before third moult, about seventy days old, it measures while resting about $\frac{3}{8}$ in. long. The general colouring is pale greyish-green, but some are of a decidedly ochreous hue; in all other respects they are precisely similar to previous stage.

After third moult, and seventy-five days old, the whole of the colouring of the body is a dull olive-green, slightly paler on the ventral surface including the claspers; the legs are black and shining; the head now exhibits two ochreous vertical parallel lines down the crown, and an ochreous $\wedge$ marking above the mouth; otherwise the form and structure of the larva is similar to the earlier stages.

After fourth moult and full-grown, about one hundred days old, it measures $1\frac{1}{8}$ in. in extreme length while crawling. The head is large and similar to previous stage in colour. The first segment is very small, elastical, and retaining the black collar of former stages; the following segments gradually increase in size to the sixth, and taper from the ninth to twelfth. The entire surface is densely sprinkled with minute shining black warts, each emitting a tiny amber-coloured spine with a clefted knobbed apex; those on the ventral surface are simple spines, and rather longer. The skin is also covered with fine regular granulations, which are dusky in colour, and exceedingly minute. Besides these, there are sprinkled over the whole surface very small spiracular-like processes, the largest being situated on the claspers (which have a shining whitish film-like surface stretched

over the centre), and one on each segment below the true spiracle, which (the latter) is conspicuous, black and shining. The tenth and eleventh segments have the anterior half of the ventral surface covered with a white rough granular waxy substance.

If disturbed while crawling, the larva frequently wriggles backwards very rapidly, similar to the habit of wriggling possessed by many micro larvæ.

Just before pupation the larva often crawls restlessly about, but in some instances it does not leave its place of feeding, and spins a strong coarse network cocoon among the grass close to the ground, weaving the gnawed loose pieces of grass with the fine stems and blades, and therein pupates during the latter part of July.

The pupa measures $\frac{3}{4}$ in. long. The head is rounded; the thorax slightly swollen; the abdomen cylindrical and tapering, terminating in a long anal point furnished at the extremity with an ample bunch of cremastral hooks, which are very securely anchored to a pad of silk spun for the purpose at the end of the cocoon. The head, thorax, and abdomen are clothed in short stiff spines; below the spiracles they occur in dense tufts. Those on the head are remarkably formed, all the longer ones terminate in a hook; these are in patches, the largest patch covering the eye. These hooks are also fastened into the cocoon, so that the pupa is securely anchored "fore and aft." At the base of the wing is a peculiar raised disc. The whole surface of the wings, antennæ, and legs are covered with a lilac-grey bloom, which is very easily detached; it also covers the cocoon like whitish powder, and small flakes are scattered over the pupa, apparently of the same substance as that on the larva. The head and thorax are pale olive, mottled with blackish; the abdomen olive, spotted with dark olive, and inclining to yellow on the ventral surface; below each spiracle is a short longitudinal mark; the spiracles are amber-brown. This description is of the female pupa. The male differs by having a well-defined elongated dusky ridge covering the androconial mark on the primary wing.

The first one, a fine female, emerged on August 3rd, 1901. All its stages much more resemble those of a moth than a butterfly.

It is curious to note that, besides other plants, *Coronilla varia* is given as the food-plant of *H. comma* by several authors, including Barrett, 'Lepidoptera of the British Islands'; Kirby, 'European Butterflies'; Meyrick, 'Handbook of British Lepidoptera'; Westwood and Humphreys, 'British Butterflies'; and the descriptions given of the larva by many are so variable that they are equally misleading—obviously the result of copying from one to the other.

October, 1901.

NOTES FROM SOUTH DEVON.

BY GEORGE T. PORRITT, F.L.S., F.E.S.

As supplementary to Mr. G. H. Heath's notes on the Lepidoptera of South Devon during August last (*ante*, pp. 267-269), it may be advisable to place on record my own and a friend's experiences there, but on another part of the coast, a month later.

Encouraged by the success of the previous year, I went down on August 30th, and remained until September 17th, my object being to take the remaining specimens necessary to fill up my series of the four rarities—*Leucania vitellina*, *L. albipuncta*, *Laphygma exigua*, and *Heliothis armigera*. In this, however, I was no more fortunate than was Mr. Heath, for of the four I only took *H. armigera*, and it was not only scarce, but in poor condition; oddly, last year this species occurred in fewer numbers than any of the others. It was clear to us afterwards, however, that lepidopterists had visited South Devon too early this year, as scarcely any of the late summer species came to the sugar during my first fortnight, but plenty of ordinary July and early August species, and they were in perfect condition. I felt sure even then that the good things would turn up later, and so it proved. I had to leave on Tuesday, September 17th, but a friend I left there continued to sugar, and on the following Monday, September 23rd, took the first two *L. vitellina*, and this species was then captured *every night that week*. *L. albipuncta* was also taken, and *H. armigera* continued to occur. Singularly *L. exigua*, which last year was taken in some numbers, and was the commonest species of the four, was not seen at all on that ground this year. *Caradrina ambigua* was fairly common all the time I was there, and continued in good condition quite a fortnight after I left; but still was by no means so plentiful as in the previous year, when almost any number might have been taken.

The more ordinary species were much the same as we took in 1900 (see *Entom.*, Dec. 1900, pp. 326-328), though several were apparently altogether absent. *Stilbia anomala* was less numerous, but *Noctua neglecta* was, I think, commoner than in 1900. *Agrotis saucia*, though fairly common, was not so abundant as in the previous year; and the pretty *Bryophila muralis* was this year quite over on our arrival. *Calocampa vetusta* was, I think, the only new visitor to sugar, and it only occurred at near the end of my visit; as did also *Anhocelis lunosa* and *Polia flavocincta*, *lunosa* being more variable than I have ever seen it elsewhere. After I left, *Aporophyla australis*, *Epunda lichenea*, and *E. nigra* occurred, the last-mentioned in abundance. *Acidalia promutata* (*marginepunctata*) was the most noticeable geometer,

occurring on rocks all over the district. *Melanippe galiata* was also again common, but getting worse for wear. The entire absence of *Colias edusa*, which last year occurred wherever we went, was a very noticeable feature; but *Sphinx convolvuli*, not noticed in 1900, was not uncommon if one could have spared the time at dusk to work for it. *Macroglossa stellatarum* occurred about flowers and walls. Of Odonata, the pretty *Æschna mixta* was again fairly abundant; but the only other species seen was *Sympetrum striolatum*, also abundant. Of Orthoptera, a fresh species turned up in *Thamnotrizon cinereus*; and, as last year, *Locusta viridissima*, *Mecanema varium*, and *Ectobia Panzeri* all occurred at sugar, the last-mentioned in plenty. But *Leptophyes punctatissima*, which in 1900 was a common visitor with the others, was this year quite absent. *Xiphidium dorsale*, which last year occurred commonly in the marsh frequented by *Æ. mixta*, was not searched for, or would probably have been found again.

Crosland Hall, near Huddersfield, Nov. 5th, 1901.

DESCRIPTION OF A NEW SPECIES OF *CRYPTURUS* FROM SPAIN.

By P. CAMERON.

CRYPTURUS FULVIPES, sp. nov.

Niger, late fulvo-maculato; pedibus antennisque fulvis; coxis nigris; alis hyalinis, stigmatibus fulvo. ♀. Long. 11 mm.

Hab. Gibraltar (*J. J. Walker, R.N.*).

Antennæ not quite so long as the abdomen, of equal thickness throughout; the scape pale yellow, black above. Head black; the face, clypeus, labrum, the basal half of the mandibles, the inner orbits, the outer almost entirely, and the lower part of the front, orange-yellow; the black on the centre of the front is narrowed on the lower part, and is united to the black on the vertex; there is an oblique black mark, narrowed above, over each of the antennæ, and two marks on the centre of the face touching the clypeus, and prolonged to the clypeal foveæ on the lower side; there is a small yellow line on the top of the vertex in the centre. The vertex is strongly and closely punctured; the centre of the front is irregularly transversely striated. Thorax black; the upper edge of the pronotum all round, two irregular marks on the base of the mesonotum, narrowed towards the base and produced on the inner side at the apex, two marks behind the centre, the scutellar keels, the scutellum, the apex of the post-scutellum, the apical slope of the median segment, the greater part of the prosternum, two large marks on the centre of the mesosternum, its sides irregularly behind, these yellow marks being continued up the mesopleuræ, where they become irregularly narrowed, and a large oblique mark on the lower part of the metapleuræ, orange-yellow. The whole thorax is closely and almost uniformly punctured. Legs fulvous; the four

anterior coxæ and trochanters are pale yellow; the hinder coxæ black, except at the base behind; the hinder trochanters yellow, the basal two-thirds of the basal joint black; the terminal joint of the hinder tarsi black. Wings hyaline; the stigma pale, the nervures dark fulvous. Abdomen black; the apices of the basal five segments broadly orange-yellow; on the apex of the sixth are two broad yellow lines; the ventral segments are irregularly banded with yellow on the apex; the apex of the last segment is brownish.

[As I am not quite sure if this species can be referred to *Crypturus*, or if it should not form the type of a new genus, I have thought it as well to give a full generic description of it. *Crypturus* is a parasite in the nests of *Polistes*. The present species has certainly a considerable resemblance to that wasp-genus.]

Parapsidal furrows obsolete. Median segment with two transverse keels, widely interrupted in the middle. Antennæ stout, as long as the abdomen, of equal width throughout; the last joint double the length of the preceding. Petiole long; the post-petiole wider than the basal joint; the whole is longer than the second segment. Wings without an areolet; the transverse cubital nervure is very short, the radial and cubital nervures being almost united; the transverse basal nervure is interstitial; the recurrent nervure is received distinctly behind the transverse cubital nervure; there is no nervure on the cubito-disco or recurrent nervures; in the hind wings the median nervure is broken above the middle. The head is broader than long; it is well developed behind; there is a long oblique slope from the ocelli behind, above the keel on the occiput, which is margined. Eyes large, slightly converging below. Clypeus short, broader than long, separated from the face; the apex is obliquely depressed, and slightly incised in the middle. Labrum large, its apex rounded. Mandibles large, the teeth large; the upper is slightly larger than the lower. Palpi large; the second joint of the maxillary is dilated. Scutellum large, flat; the basal keels broad. Post-scutellum bifoveate at the base. The spiracles linear; there is a curved keel outside them. On the centre of the median segment are two indistinct longitudinal keels running to the transverse keel. The hinder legs are much longer than the four anterior; the hinder coxæ are more than twice longer than thick; the front tarsi are twice the length of the tibiæ; the claws small, simple; the hinder tibiæ are longer than the femora; the metatarsus is longer than the other joints united. There is one spur on the front and two on the four posterior tibiæ. The spiracles of the petiole are placed beyond the middle at the base of the post-petiole; the second abdominal segment is longer than broad; the third is square; the others broader than long; the apical segment is bluntly pointed, wide, keeled down the middle above; the hypopygium is large, broad, and does not project beyond the last segment; the sheaths of the ovipositor are broad and as long as the apical segment. The four posterior tibiæ and tarsi are spinose; there is a wide shallow furrow on the mesopleuræ near the sternum; the abdomen is twice the length of the thorax; the abdominal spiracles are large and distinctly visible. There are eight abdominal segments.

SOME NOTES ON *XYLOMIGES CONSPICILLARIS*.

BY HARRIS DOIDGE.

ON page 130 of the present volume you were good enough to publish a record from me of this insect in Somerset. Subsequently to the two reported, my friend Mr. Butler and I had a dozen emerge in our breeding cases.

The pupæ were obtained in a private park several miles from here, and in answer to Mr. Percy C. Reid's enquiry (*ante*, p. 157), they were dug under both oaks and elms, their presence there being probably due to the fact that their food-plant—the bird's-foot trefoil—happened to grow in immediate proximity.

After losing several in futile attempts to procure a pairing, we were at last fortunate in obtaining a fine batch of ova.

The impregnated female was placed on a growing plant of bird's-foot trefoil (*Lotus corniculatus*), but the ova were deposited in a compact batch on the lino covering instead of on the food-plant. They were laid on May 21st, and were at first nearly white, soon changing to a pale lilac shade. On May 31st the larvæ hatched almost simultaneously, and were at once placed on their food-plant. The young larvæ, which on hatching were a purplish grey colour, began feeding on the yellow flowers, and rapidly became of the same colour. After finishing the flowers they commenced on the leaves, by which time they were a pale green colour, with a yellow spiracular stripe, and were fond of resting by day on the stems of the plant. As they approached the final stage, the green became shaded with brown and black, the larvæ now bearing a remarkable resemblance to the seed pods which were ripening. This protective colouration was equally noticeable when the young larvæ were feeding on the flowers, and later, when resting on the stems. Finding a difficulty in procuring food for them, we gradually shifted them on to blackthorn, to which they adapted themselves freely, feeding by night, and hiding in crevices and under leaves by day. We found they would also eat dock and the lesser trefoil (*Trifolium minus*), the former sparingly.

About July 8th they began to go under ground to pupate. The pupæ, which were of a dark reddish brown colour, and somewhat obese and blunt, being enclosed in a very compact and brittle earthy cocoon.

We should be glad to know if this insect is as rare now as formerly, and in what localities it has been recorded of late years.

Sherford, Taunton : November 6th, 1901.

A LIST OF THE LEPIDOPTERA OF COUNTY CORK.

By C. DONOVAN, M.D., F.E.S., Capt. I.M.S., and R. J. F. DONOVAN.

As supplementary to Mr. Kane's "Catalogue of the Lepidoptera of Ireland," which has now appeared in book form, we considered our captures since 1883, in the neighbourhood of Glandore, Timoleague, and Courtmacsherry, in this county, would prove acceptable to those of your readers interested in the geographical distribution of Lepidoptera of our islands. Many of the insects procured near Glandore and Timoleague have already been included in Mr. Kane's list, but several were, for some unaccountable reason, omitted. All our specimens, except those easily recognizable and common, have been seen and verified by Messrs. Kane and Barrett, to whom we cannot sufficiently express our gratitude for the kind help they have at all times so readily afforded us. We regret our list of Micro-Lepidoptera is of such a meagre and fragmentary nature; however, one of us hopes to remedy this defect next year by giving more attention to this interesting group.

The first named of the contributors of this list collected at Glandore from 1883 to 1889, at Bandon from 1890 to 1891, and Courtmacsherry this year. The second, at Timoleague, since 1896 to the present time. Glandore and Courtmacsherry are on the sea-coast, while Timoleague is about five miles inland and the same distance from Courtmacsherry.

Occasional excursions have been made inland, as to Gougane Barra, the source of the river Lee; Dunmanway and Drimoleague, north of Skibbereen.

The abbreviations used in our list, *viz.* G., T. and C., stand respectively for Glandore, Timoleague, and Courtmacsherry.

RHOPALOCERA.

Pieris brassicæ, *P. rapæ*, and *P. napi*, common. *Euchloë cardamines*, common. *Colias edusa*, common in some years, T. and G. *Argynnis aglaia*, several. *A. paphia*, common. *Melitæa aurinia*, common in suitable localities (the type, with the handsome var. *hibernica*). *Vanessa io*, *V. urticæ*, *V. atalanta*, and *V. cardui*, common. *Pararge egeria* and *P. megæra*, common. *Satyrus semele*, common, especially on the sea-coast. *Epinephele ianira*, *E. tithonus*, and *E. hyperanthes*, common. *Cænonympha pamphilus*, common. *Thecla quercus*, common in some woods near T. and G. *T. rubi*, common, G. and Dunmanway; few, T. *Polyommatus phlæas*, common. *Lycæna icarus*, common. *L. minima*, several near C.

HETEROCERA.

SPHINGES.—*Acherontia atropos*, one larva in 1896; an imago on Sept. 20th, 1899; another on Sept. 29th, 1900, T.; a couple,

G. Sphinx convolvuli, two in Sept. 1900; a few in Aug. and Sept. 1901, T.; common in some years, G., at flowers of *Nicotiana affinis*. *Cherocampa porcellus*, few, T.; common, C. *C. elpenor*, three imagines and a few larvæ, T.; several G.; few, C. *Smerinthus ocellatus*, a few larvæ every year, T.; common in larval stage, G. and C. *S. populi*, larvæ not uncommon, T.; larvæ common, G. *Macroglossa stellatarum*, plentiful in 1899, rather scarce in other years, T.; common, G. and C., varying in numbers in different years. *M. bombylifformis*, not common, T.; common, G. and C. *Trochilium apiforme*, common near Bandon; few, G. *Sesia musciformis*, common on rocks by the sea, between the Old Head of Kinsale and Glandore; larvæ were found in different stages of growth through the year, an occurrence that leads us to believe the larval stage lasts for two years. One of us is to give further attention in solving the life-history of this clearwing with a view of coming to a decided opinion as to the length of life of the larva. Pupæ were found from the beginning of June to the first week in July only. *Ino statice*, rather scarce, T.; common, G.; several, C. *Zygæna filipendulæ*, common.

BOMBYCES.—*Sarrothripus undulatus*, by no means uncommon, T.; one, C. *Hylophila prasinana*, common, especially in pupal stage, T. and G. *Nola confusalis*, rather plentiful, T.; common at C., quite a pest "dusking"; several, G. *Nudaria mundana*, common. *Lithosia complana*, common, C. *Gnophria quadra*, plentiful in pupal and larval stages, T.; five, G. *G. rubricollis*, formerly more plentiful than during the last year or so, T.; several, G. *Deiopeia pulchella*, one near Bandon. *Euchelia jacobææ*, abundant. *Arctica caia*, common in the larval stage. *Spilosoma fuliginosa*, larvæ scarce, one imago in 1899, T.; several, G. *S. mendica*, rather scarce, all var. *rustica*, with the exception of one intermediate between this and the type, T.; several, G. and Bandon; a few C.; all referable to *rustica*. *S. lubricipeda*, common. *S. menthastri*, very common. *Hepialus humuli*, common. *H. velleda*, scarce, T.; common, G. and C.; the var. *gallicus* fairly common. *H. lupulinus*, common. *Dasychira pudibunda*, rather plentiful, especially in larval state, T., G., and Bandon; a few, C. *Orgyia antiqua*, common, T. and G. *Pæcilocampa populi*, a few specimens in different years, T.; one near Bandon. *Bombyx neustria*, one, T. *B. rubi* and *B. quercus*, common. *Saturnia pavonia*, common on heaths. *Dicranura vinula*, common, especially in the larval state. *Lophopteryx camelina*, larvæ not uncommon, several imagines. *Notodonta dictæa*, one near Bandon. *N. ziczac*, two larvæ, T.; fairly common, G.; one at Dunmanway. *N. chaonia*, four males at light, C. (all very large and dark coloured); one female near Rosscarberry. *Phalera bucephala*, common, especially in the larval state. *Pygæra pigra*, several larvæ procured at Gougane

Barra and Pass of Keimaneigh, July 22nd, 1901. *Thyatira derasa*, fairly common. *T. batis*, common, much more so than the preceding.

NOCTUÆ.—*Bryophila muralis*, seven imagines and about five more seen on rocks by the sea, Courtmacsherry. Pupæ were found in cocoons between plants of *Armeria* and the rock adjoining. All the specimens procured were of a greyish-green colour, no marked variation; the var. *impar* not found. *B. perla*: Mr. Kane says this species is common and widely distributed, but we have secured only a single specimen this year at T. Close examination of old walls in the neighbourhood has proved unsuccessful in discovering any more. *Demas coryli*, scarce, T.; several, G.; one, C. (an especially large and dark-coloured male). *Acronycta psi*, scarce, T.; few at Glandore, near Bandon and C. *A. aceris*, there is a mistake in Mr. Kane's list about my (*C. D.*) procuring pupæ of this insect at Glandore; the pupæ alluded to produced *M. brassicæ*; I have, however, seen the conspicuous larvæ there, so the entry may stand. *A. rumicis*, common; the var. *salicis* is found commonly with the type. *A. euphorbiæ*, larvæ common in 1901 on *Plantago maritima* growing on rocks by the sea, C., in the months of June and July. The imagines emerged from these larvæ in August; this late emergence is most unusual in the British Islands. A single larva at Gougane Barra in July on *Salix cinerea*; this was unfortunately ichneumonised. *Leucania conigera*, common. *L. vitellina*, one specimen at sugar, Sept. 11th, 1901, at Courtmacsherry; the insect has been seen by Messrs. Barrett and Kane. *L. lithargyria*, common, *L. unipuncta (extranea)*, one in September, 1896, T., seen by Mr. Kane; another in the same month this year, C., seen by Messrs. Barrett and Kane. *L. littoralis*, one, G. *L. comma*, common. *L. straminea*, a single specimen near C. *L. pallens*, common. *L. impura*, common. *Tapinostola fulva*, one specimen, 1897, T. *Nonagria sparganii*, common in half a dozen marshes between the Old Head of Kinsale and Glandore. Young larvæ in *Iris*, older in *Sparganium*, and sometimes in *Typha latifolia*; pupæ invariably in the two latter plants, never in *Iris*, as far as our present experience goes. One pupa in dead stem of *Arundo phragmites*. *N. arundinis*, common wherever the food-plant exists. *Hydræcia nictitans*, common and very variable. *H. micacea*, not common, T.; common, G. and C. *Axylia putris*, fairly common. *Xylophasia rurea*, fairly common. *X. lithoxylea*, common. *X. sublustis*, one specimen, C. *X. monoglyphæ*, abundant and variable. *Laphygma exigua*, one imago at honeydew on lime, Sept. 8th, 1899, T. *Neuria reticulata*, three, G.; two, C. *Neuronis popularis*, common, T. and C.; several, G. *Charcæa graminis*, common in some years, G. and T. *Luperina testacea*, common. *L. cespitis*, scarce, T.; several, C.; a few almost black in colouration. *Mamestra farva*, a couple, C. and

G. *M. brassicæ*, very common. *M. persicarice*, two or three specimens; larvæ not so scarce, T.; several, G.; and about half a dozen, C. *Apamea basilinea*, common, G. and C. *A. gemina*, common, both forms exist. *A. leucostigma*, one specimen, G. *A. didyma*, very common and variable. *Miana strigilis*, common. *M. literosa*, not scarce, T.; common, G. and C. *M. bicoloria*, rather scarce, T.; common, G. and C. *Grammesia trigrammica*, common. *Stilbia anomala*, scarce, T.; several, G.; one, C. *Caradrina morpheus*, one specimen, C. *C. taraxaci*, common; very partial to flowers of *Teucrium scorodonia*. In a fairly long series obtained at C., Mr. Barrett failed to find any *alsines*. Mr. Kane says, "not apparently in great numbers;" this is not our experience, as we found it very common. *C. quadripunctata*, common. *Rusina tenebrosa*, common, T.; several, G. and C. (all the melanic variety). *Agrotis vestigialis*, a few near G. *A. suffusa*, common. *A. saucia*, common in the autumn brood. *A. segetum*, very common. *A. lunigera*, four specimens at C., at sugar in a lane about two hundred yards from the sea, with no precipitous cliffs for several miles distant. *A. exclamationis*, very common.

(To be concluded.)

SOME SYSTEMATIC WORK PUBLISHED DURING THE LAST FIVE YEARS UPON NORTH AMERICAN AU- CHENORRHYNCHOUS HOMOPTERA (RHYNCHOTA).

By G. W. KIRKALDY, F.E.S.

1897. H. OSBORN & E. D. BALL, "Contributions to the Hemipterous Fauna of Iowa" (Proc. Iowa Acad. Sci. iv. pp. 172-234, plates 19-26).
1897. E. P. VAN DUZEE, "A Preliminary Review of the North American Delphacidæ" (Bull. Buffalo Soc. Nat. Sci. v. pp. 225-61).
1898. OSBORN & BALL, "Studies of North American Jassoidea" (Proc. Davenport Acad. Nat. Sci. vii. pp. 45-100, plates 1-6); "The Genus *Pediopsis*," and "A Review of the North American Species of *Idiocerus*" (Proc. Davenport Acad. vii. pp. 111-38).
1898. BALL, "A Review of the Cercopidæ of North America, North of Mexico" (Rep. Iowa Ac. Sci. pp. 204-26).
1900. OSBORN, "The Genus *Scaphoideus*" (Journ. Cinc. Soc. Nat. Hist. xix. pp. 187-209, plates 9, 10).
1901. BALL, "A Review of the Tettigonidæ of North America, North of Mexico" (Proc. Iowa Acad. viii. pp. 35-75, plates 1-7).

Our knowledge of North American Tetigoniidæ (or Jassoidea,

as they are generally called in America), Cercopidæ, and Asiracinae (Delphacidæ) has of late years been considerably increased, chiefly through the labours of Van Duzee, Osborn, Ball, C. F. Baker, C. P. Gillette, and others, to a large extent, no doubt, because these insects are of some economic importance.

Seven papers by three of these authors are now noticed, not because the remaining publications during the past five years are not valuable, but because those chosen are to some extent monographic revisions of difficult and little-known groups.

Van Duzee admits twelve American genera of Delphacidæ,* with over fifty species, which will certainly be greatly extended by future workers. Of these, seven genera and four species are found also in Western Europe. Osborn and Ball have furnished detailed descriptions and valuable figures of *Deltocephalus*, *Pediopsis*, *Idiocerus*, *Agallia* (all European genera); while Osborn has revised *Scaphoideus*, a genus closely allied to *Deltocephalus*, but restricted to America. Ball has also reviewed the Cercopidæ, admitting six genera (four also West European) and sixteen species. The revision of the Tettigonidæ deals with *Tettigonia* and its near allies, *Gypona* being reserved for a future paper. Seven genera are recorded.

These seven papers comprehend some 270 pages, with twenty-three plates, the latter embracing nearly five hundred illustrations. In the attention paid to structural details (especially of the genital segments), and in the broad and philosophical view taken of "variation," the "limits of species," &c., and in the general preparation of the descriptions, I have no hesitation, having regard to the obscurity of most of the groups dealt with, in placing them as a whole in the very front rank of homopterous publications. It may be noted, as some proof of the interest taken in the Homoptera, that these authors have criticised and recriticised one another's writings very freely in the pages of 'Psyche,' 'The Entomological News,' and other publications.

Having regard to the fact that not only a number of genera, but even of species, of the Homoptera are common to America and Europe, the descriptions and detailed figures cannot but be useful to British entomologists. The papers are elucidated by copious analytical tables of genera and species; but though the black illustrations appear to be carefully drawn, coloured figures of some at least of the remarkable variations mentioned would have perhaps enhanced their value. There are many valuable observations and notes on the habits and metamorphoses of American Homoptera, which will be summarized later on in another paper.

The following is a list of the Auchenorrhyncha common to North America and Western Europe; it is probably incomplete

* The nomenclature of the several authors is employed to prevent confusion.

as regards the Membracinæ (a subfamily of Tetigoniidæ), *Typhlocyba*, and other genera, as I have none of Goding's or Gillette's later papers before me while writing.

Fam. CERCOPIDÆ.

The genera *Cercopis* (= *Philænus*), *Tomaspis*, *Aphrophora*, *Lepyronia*.

1. *Cercopis spumaria* (Linn.). Eastern Canada; the New England States; (also Japan).

2. *Cercopis lineata* (Linn.). The same American localities as the preceding.

Fam. FULGORIDÆ.

The genera *Stenocranus*, *Kelisia*, *Dicranotropis*, *Stiroma*, *Megamelus*, *Achorotile*, and *Embolophpora* (= *Liburnia*).

3. *Megamelus notula* (Germar). Ontario; New York.

4. *Achorotile albosignata* (Dahlb.). New York.

5. *Embolophpora pellucida* (Fabr.). (The northern Old World to Kamtchkatka). America, from Alaska to New York.

6. *Embolophpora obscurella* (Boheman). New York.

Fam. TETTIGONIDÆ (= Jassoidea).

Genera *Agallia*, *Alebra*, *Aphrodes* (= *Acocephalus*), *Athysanus*, *Balclutha* (= *Gnathodius*), *Bythoscopus*, *Cicadula*, *Deltocephalus*, *Dikraneura* (= *Dicraneura*), *Dorycephalus*, *Empoasca* (= *Kybos*), *Euacanthus*, *Hecalus*, *Idiocerus*, *Ledra* [doubtful], *Macropsis*, *Parabolocratus*, *Paramesus*, *Pediopsis*, *Penthimia*, *Phlepsius*, *Platymetopius*, *Strongylocephalus*, *Tetigonia* (= *Tettigonia*), *Thamnotettix*, *Typhlocyba*, and *Ulopa*.

SPECIES.

7. *Aphrodes albifrons* (Linn.). Canada, New England States, and Michigan.

8. *A. flavostriata* (Donovan) (= *ricularis*, Germ.). Vermont.

9. *A. fuscofasciata* (Goeze) (= *brunneobifasciata* and *serratulæ*). New Jersey.

10. *A. nervosa* Schrank (*striata*, auctt.). Canada; New York.

11. *Athysanus obsoletus* (Kirschb.). Canada; New York; Iowa.

12. *A. striatula* (Fallén). Iowa.

13. *A. striola* (Fallén). Canada; New York.

14. *Balclutha punctata* (Thunberg). Canada; widely distributed in the United States to Texas.

15. *Cicadula punctifrons* (Fallén). New York; Iowa.

16. *C. sexnotata* (Fallén). Whole of North America.

17. *C. variata* (Fallén). Canada; New York; Michigan.

18. *Deltocephalus ocellaris* (Fallén). Colorado.

19. *Dikraneura flavipennis* (Fallén). Iowa.

20. *Empoasca smaragdula* (Fallén). Almost whole of North America.

21. *Strongylocephalus agrestis* (Fallén). New York; Iowa; Michigan.

A total of thirty-eight genera and twenty-one species.

A few words on the nomenclature of some homopterous genera may not be out of place here.

1. It does not seem to be generally known that Hardy's genus was *Dikraneura* (not *Dicraneura* as usually spelt).

2. In the 'Transactions' of the Entomological Society of London (1894, pp. 411-3), Mr. W. F. Kirby discusses the synonymy of two Tetigoniid genera, viz. *Cephalelus* and *Dorydium*, and concludes that the type of the latter is *lanceolatum*, Burm.

Kirby has fallen into error here through assigning a wrong date for the publication of the rhynchotal portion of Burmeister's 'Handbuch der Entomologie.' This was not 1839, as Kirby states, but 1835,* as far as pp. 1-396 are concerned; pp. 1005-17 were indeed published in 1839. *Cephalelus* was founded in 1832 by Percheron in Guérin's 'Magazin Zool.,' type *C. infumatus*. In 1835 Burmeister ('Handbuch,' ii. p. 106) erected *Dorydium*, type *paradoxum*. In 1838 the same author ('Genera Insectorum') stated that these two genera were founded on the same insect, and transferred the name *Dorydium* to a new species, *lanceolatum*, and this was also noted in 1839 in the table of corrections, &c., appended to vol. ii. of the 'Handbuch' (p. 1006).

The following synonymy will therefore be necessary:—

- (1.) CEPHALELUS, Bercheron, 1832, type *infumatus*, Perch.; Signoret, 1879, Ann. Soc. Ent. France (5), 9, p. 259.
= *Dorydium*, Burm., 1835, type *paradoxum*, Burm.
- (2.) PARADORYDIUM, n. n., 1901, type *lanceolatum* (Burm.).
= *Dorydium*, Burm., 1838 and 1839, type *lanceolatum*, Burm.; Signoret, l. c. p. 261; Kirby, 1894, l. c.; Puton, 1899, Cat. Hémipt. paléarct., ed. 4, p. 93.
- (3.) Gen. nov.? (type *westwoodi*, F. B. White).
= *Dorydium*, F. B. White; Signoret, 1880, l. c. (5), 10, p. 43.

3. The first palæarctic genus of the Agallini (Bythoscopini) founded was *Agallia*, Curtis (Jan. 1833), type [*consobrina* =] *puncticeps*, Germ. In the same year (July or after) Germar erected *Bythoscopus*, no type being fixed. In 1835 Lewis proposed three genera: (1) *Batracomorphus*, type [*irroratus* =] *microcephala*, Schaff.; (2) *Macropsis*, with two species *virescens* (Fabr.) and *flavicollis* (Linn.); and (3) *Idiocerus*, the application of which is not disputed. He also fixed *lanio* (Linn.) as the type of *Bythoscopus*, Germ. In 1838 Burmeister ('Gen. Insect.') divided *Bythoscopus* into four subgenera: (1) *Bythoscopus*, not that of Germar, restricted by Lewis; (2) *Idiocerus*; (3) *Oncopsis*, Burm.

* See, amongst other contemporary references, Burmeister, 1836, Arch. Naturg. ii. pt. 2.

part of *Macropsis*, Lew., in which is included *Macropsis flavicollis* (Linn.), Lew.; and (4) *Pediopsis*, Burm. = part of *Macropsis*, Lew., with type *Bythoscopus tilia*, Germ.* As *lanio* is scarcely to be separated generically from *microcephala*, Schöff., *Batracomorphus* becomes a synonym of *Bythoscopus*, Germ., Lew. In 1843 Amyot and Serville ('Hémiptères') named *lanio* as the type of *Macropsis*, notwithstanding that it did not conform to Lewis's description, and had already been fixed as type of *Bythoscopus* by Lewis. The type of *Macropsis* has, in fact, never been properly fixed. It must be either (1) *flavicollis* or (2) *virescens*. I now fix it as the former as least objectionable. The name *Macropsis*, Lewis, cannot be used for *lanio* and its congeners, because it was, as stated above, founded for two species only, neither of which belongs to the same genus as *lanio*. The synonymy will then be:—

- (1.) BYTHOSCORUS, Germ., 1833, type *lanio* (Linn.), Lewis.
 = *Batracomorphus*, Lewis, 1835, type [*irroratus*,
 Lew.] *microcephala*, Schöff.
 = *Macropsis*, auctt.
- (2.) MACROPSIS, Lewis, type *flavicollis* (Linn.), Kirk.
 = *Oncopsis*, Burm., 1838, type *tilia* (Germ.), Burm.
 = *Bythoscopus*, auctt.

4. Van Duzee adopts the generic name *Liburnia*, Stål, for *pellucida*, &c. He is certainly correct in not employing *Delphax*, Fabr., as has Puton in the fourth edition of the Catalogue of Palæarctic Rhynchota.

The type of *Delphax* must be either *Cicada clavicornis*, Fabr., or *Cicada crassicornis*, Fabr., for these two were the only species included in the genus at its foundation in 1798. The former was fixed as the type of *Asiraca*, Latreille (1796), in 1810. I have not yet been able to trace a proper type-fixation for *Delphax*. *Liburnia*, Stål, 1866, is preoccupied by *Embolophora*, Stål, 1853 (not *Embolophora*, as Stål himself writes it later), and the latter name should be used. The somewhat complicated synonymy therefore stands:—

- (1.) ASIRACA, Latr., 1796, type *clavicornis* (Fabr.), Latr., 1810.
 = ? *Delphax*, Fabr., 1798 (typical).
- (2.) ARÆOPUS, Spinola, 1839, type *crassicornis* (Fabr.), Spin.
 = ? *Delphax*, Fabr. 1798 (typical).
- (3.) EMBOLOPHORA, Stål, 1853,
 = *Liburnia*, Stål, 1866.
 = *Delphax*, mod. auctt.

* "Ab omnibus speciebus hujusce sectionis hæc optime cum caractere subgeneris congruit."—Burm. l.c.

SELENIA ILLUSTRARIA (TETRALUNARIA) AND ITS BROODS.

By F. MERRIFIELD, F.E.S.

MR. GARRATT's experience, as given in your October number (*ante*, p. 288), is not an uncommon one. Sometimes a whole brood, hatched from the egg in May, will "go over" until spring, more often only a few of them. When a brood "splits" in this way, those which go over are always on the average much larger than those which emerge in July. This is no doubt because there is a similar difference in size between the natural spring emergence and the natural summer emergence; and the larvæ which go over belong physiologically to the spring form, one of the attributes of which is largeness. Experiments tried by me on a large scale have shown that the question to which of the two forms—the large spring one or the small summer one—the individual will belong is decided in a very early period of the larval life, but not—at all events unalterably—earlier. I have had, by forcing from the beginning of the oval stage, five generations in the year, of the allied species *S. bilunaria* (*illunaria*), all of the summer form, but have not been able to thus change the destination by forcing half-grown larvæ or pupæ. I had some large broods this year of *S. tetralunaria* larvæ, from eggs laid by the summer emergence early in July, which were beginning to pupate just before I went abroad on Aug. 16th, and when I returned on Sept. 20th I found many more had pupated, and by the beginning of October almost all had done so, giving me nearly 170 pupæ. Those which pupated before and during my absence had been placed in a refrigerator, as I felt sure some would otherwise emerge before my return. When nearly all had pupated—about a fortnight since—I picked out twenty-four, which I judged from their small size to belong to the summer-emerging division, and forced twelve of them. All but two of the largest of these emerged (except two which died) in less than a week. These two largest, after a fortnight's forcing, are lively, and show no signs of approaching emergence, so I have added them to the majority, which will remain in pupa until next spring unless I force them; and this, my experience tells me, it will be of no use to do until about January. It may be of interest to mention that the individuals belonging to this major division are of very large size, averaging in weight: males, .3112 gramme (nearly 5 grains); females, .3900 gramme (over 6 grains). I have two other broods of practically the same weight; the heaviest individuals are: males, .3900 gramme; females, .5300 gramme (about 8 grains). I have no doubt that these results are owing to my having crossed individuals from Germany with some from England, for they are more than 50 per cent. heavier

than the pupæ from which their English and German grandparents came last spring. Possibly this increase of size is in a slight degree owing to my having given the larvæ a considerable change of diet, which I have found very useful in checking the deterioration caused by breeding in and in. This is quite in conformity with what might have been expected, in accordance with the views of Darwin and Wallace, as to the advantages arising from a change of physical conditions. I add that the benefit of crossing, &c., showed itself in the summer emergence, the pupæ of which were nearly as heavy as those of their English and German parents.

24, Vernon Terrace, Brighton: Oct. 13th, 1901.

A NEW LAC-INSECT FROM SOUTH AFRICA.

By T. D. A. COCKERELL and G. B. KING.

Tachardia actinella, n. sp.

♀. Scale about 3 mm. long, 3 broad, and scarcely 2 high, rounded and depressed, dark crimson, with about sixteen strong but obtuse radiating yellowish white ridges; centre of scale formed as in *T. decorella*. The scales are mostly separate, but sometimes two or more coalesce.

♀. Dark red, $2\frac{1}{2}$ mm. long, $1\frac{1}{2}$ broad; bright pink when boiled in caustic potash; this colour is due to the internal juices, the skin being perfectly colourless. Antennæ stout, cylindrical, pale, about 140 μ long, 52 broad at base, 36 in middle, 28 at end, obscurely four-jointed. Lac-glands with over 60 orifices. Mouth-parts about 141 μ broad. Spine well-developed, 120 μ long, rapidly enlarging 36 μ from tip to a very broad (95 μ) base. Anal ring with 10 long bristles; chitinous anal plate roughly semicircular, posteriorly with a deep linear incision 60 μ long; on each side of the anal plate is an elongated process terminating in two sharp spines, the structure being apparently the result of a fold in the plate. Anteriorly, the anal plate is tuberculated.

♂. Scale cylindrical, elongated, of the usual form; dark red.

Hab. Natal, on bark of undetermined tree; uncommon (Claude Fuller, No. 19). The scale might be taken for *T. decorella*, Maskell, but that Australian species has no antennæ, and the spine (according to Maskell's figure) is not broadened at the base.

INSECTS IN NORFOLK BROADLAND IN JUNE.

By ERNEST A. ELLIOTT, F.E.S., AND CLAUDE MORLEY, F.E.S.

WE had long promised ourselves a little collect in the Norfolk Broads, from which great things were, judging from our experiences south of the Waveney, to be expected, and, as a sequel, found ourselves in Norwich on the 9th of last June. Thence we started on a glorious, breathless morning to easily jog wherever the caprices of the erratic bike might chance to land us, ready to collect an hour or so at any likely spot upon the route. And they were not wanting: Surlingham Broad, Rockland Marsh, and Buckenham Ferry are splendid ground, and very hard to beat entomologically. Tea-time found us at Acle, and the next morning we limbered up in a gale, and sallied forth in its teeth with a leaden sky above us; the sampling of Filby, Rollesby, and Ormesby Broads became a trying matter with a wind that followed your net and emptied its contents as soon as captured. Thence we came down to Caister, *viâ* its grand Castle, for letters and lunch, reaching Winterton by the coast-road during the afternoon. The sandhills would doubtless be very prolific on a calm day. These elemental conditions continued on the 12th with the happy change of a much lower temperature. At Horsey the road deserted us, and the machines objected to move with any attempt at rapidity over the cracked, baked edges of the dykes till we encountered a hedge, and took more of it away than we could have wished—in our tyres. A weary drag over Brograve Level to Stub's Mill was tempered by lunch at Hickling Green, and we at length put into Stalham in a downpour. The grass was still wet when we tried to ride over a two-feet growth of it in a futile attempt to cross the Ant next morning, having eventually to detour to South Smallborough, on Barton Broad, which we agreed would be a fine locality when it was not raining with less than 50° F. Wroxham Broad was never moister than on the 14th, and we feared the sheets of water falling into it might cause an overflow, so trained to Norwich. But it looked brighter beneath a gorgeous sunset, and the Hoveton Marshes yielded several captures of note. Then the rain-god desisted, and Horning, St. Benets, Ranworth, Salhouse, and Woodbastwick next day made pretty pictures, typical of Broadland, when one managed to run out from behind the scenes, where nestle the villages and their attendant roads. The "Bell" at Norwich saw us back at night, and the next day streaming through Attleborough, on a puncture, to the home of the flint-knappers.

Thanks to the pluvial inclemency of the weather, insects were very scarce and generally of the commonest, though a few interesting species of every Order put in an appearance. The

Coleoptera comprised *Anchomenus gracilis*, Rockland, and *A. thoreyi*, Ormesby; *Laccophilus interruptus* and *Coccinella 19-punctata*, at Horsey; *Psammæchus bipunctatus* and *Anomala frischeri*, a pupa of which latter had been blown out of the sand and was lying quite exposed in a little hollow, at Winterton; *Campylus linearis*, at Surlingham, with *Silis ruficollis*, which was also common at Rockland and Horning. At the latter locality, *Telephorus figuratus* and *Malthodes dispar* also occurred with *Cryptorhynchus lapathi*, sitting on a gate-post; *Calandra oryzae*, beneath a board by a marsh hay-stack in the open levels; *Galeruca tenella*, *lineola*, *sagittariae*, and *nymphææ* (which last was in the flowers of *Nymphæa lutea*), *Psylliodes dulcamaræ* and *picina*, *Donacia clavipes* and *comari*. *D. affinis* and *semicuprea* and *Gymnetron pascuorum* were found at Rockland, and *Crypticus*, *Microzoum*, with other coast species, at Winterton. *Erirhinus nereis* turned up at Wroxham, and *Crepidodera modeeri* in the Horsey Marshes. Such aristocrats as *Donacia impressa* and *menyanthidis*, the Lixi, and other specialities of the Broads, could not be expected to turn out in the rain and cold winds, nor, needless to add, did we see *Ceuthorhynchus querceti*.

Great numbers of Hymenoptera were taken, more especially among the Ichneumonidæ, which we were more particularly anxious to work, but of these we will only notice *Ichneumon albicinctus* at Eaton; *Phæogenes collaris* on Mousehold Heath; *Collyria calcitrator* commonly with its host, *Cephus pygmaeus*, at Filby Broad on the margin of a wheat field; *Tryphon scotopterus* (which Bridgman had described as a new species under the name *Perilissus fumatus* from the vicinity of Norwich—cf. Entom. xiii. p. 54) occurred in a chalk-pit at Earlham; *Bassus letatorius*, at Filby. Mr. Nevinson, whom we had the pleasure of meeting, showed us several *Rhyssa persuasoria*, taken in the act of ovipositing in the burrows of *Sirex gigas* at Horning. *Rhogas circumscriptus* was swept at Eaton, and the curious little *Perisemus triareolatus* at Wroxham. The Tenthredinidæ were in great force all along the line. *Tenthredo atra* at Eaton and Rockland, *T. moniliata* (female) at Rockland, and *T. punctulata* at Hickling; *Tenthredopsis tiliæ* at Earlham; *Macrophya 12-punctata* was common at Surlingham and Rockland, and at the latter we took a male of the rare *M. albicincta*; two or three common *Doleri*, with *Selandria morio*, turned up at Rockland and Horning; a nice *Pœcilosoma*, probably *excisum*, Thoms., at Eaton, and *P. liturata* (= ? *guttatum*, Fall.) at Wroxham and ? Horning; we swept *Eriocampa annulipes* from the Winterton hedges, *Blennocampa albipes* at Eaton, *B. fuscipennis* at Surlingham and Hickling, *B. ephippium* and *Emphytus calceatus* at Rockland; *Dinura stilata* was found at Wroxham, *Nematus ribesii*, which is apparently very rare in Suffolk, at Winterton, *N. abdominalis* (female), at Hickling, *N. fulvipes*, at Wroxham and Horning,

and *N. ? salicis-cinereæ* at the latter Broad; *Cephus pygmaeus* was generally common, and the fine *C. linearis* occurred in the wet places at Surlingham and Rockland. Both sexes of *Sirex gigas* were cut from their borings in a pine-shed at Horning Ferry. We saw very few Aculeata, and those were common things:—*Crabro clavipes* (female) at Surlingham, *C. peltarius* at Attleborough, flying to nest in telegraph-pole; *Odynerus parietum* at Ormesby and on the Buckenham pontoon; the only bees were *Halictus leucopus* and *H. cylindricus* at Winterton and Hickling, respectively, with *Andrena minutula* (female) at Ormesby, and *H. albipes* at Hickling.

Lepidoptera we studiously avoided, annexing only a solitary *Ino statice* at Rockland. Only in one place did the glorious *Papilio machaon* appear, and we feasted our eyes, forbearing to strike so grand a friend.

Many good marsh things occurred among the Diptera, but here again the weather was all against us. *Odontomyia tigrina* was swept at dusk at Wroxham, *Microchrysa flavicornis* and *polita* common at Hickling, *Beris vallata* at Horning, a male *Hæmatopota pluvialis* swept at Surlingham, and a male *Chrysops relictus* on reeds at Horsey; *Dioctria rufipes* at Earlham and Rockland, and *Dysimachus trigonus* on the Winterton sand-hills, where also were secured two conspicuous grey Tachinids, which have baffled even Mr. Piffard's attempts to determine. Dolichopids were, of course, abundant throughout the district. *Pipunculus confusus* at Horning; *Chrysogaster hirtella* (*macquarti*) was common, and *Liogaster splendida* not rare at Horning and Wroxham; *Leucozona lucorum*, which does not abound in Suffolk, was found at Earlham; *Pyrophæna* * *ocymi* was generally common; one example of *P. rosarum* at Wroxham, with *Platychirus fulviventris*. *Eristalis sepulchralis*, far from farm ponds, turned up not rarely at Horning and Surlingham, at the latter of which was also *Helophilus lineatus* (male, female), with *H. versicolor* at Rockland. One of the most abundant flies was *Tropidia milesiformis* in all the marshes. *Ceromasia ? spectabilis* swept from reeds at Horsey; *Morinia nana* at Wroxham; *Polietes lardaria*, in which we thought to have a prize, on the wall of St. Benet's Abbey. The fine *Hyetodesia errans* along the Yare, and *H. ? variabilis* at Horning. *Melanocheilia riparia* turned up at Hickling, *Hoplogaster mollicula* at Surlingham and Horning, and *H. bicolor* at Wroxham; *Cordylura albipes* at Rockland, and *C. ? apicalis* at Surlingham. Both *Sciomyza albocostata* and *Sepedon spinipes* were swept at Horning, with *Calobata petronella*, *Ceroxys crassicornis*, and *Notiphila uliginosa*, which last was abundant in flowers of *Nymphæa lutea*. The pretty little *Pteropæctria frondescentiæ* from Hickling is the only other species worthy of note.

* Both the British species of *Pyrophæna* have occurred to me much more freely this year in various parts of the country than during any previous experience. Am I alone in this observation?—C. M.

No mention should be made of the Hemiptera were this an attempt at a representative list, though one or two exclusively marsh things, such as *Cymus glandicolor* at Wroxham and Rockland, *Acompus rufipes* at the former, and *Plociomerus fracticollis* at the latter, did happen to fall to our lot; for the rest, *Nysius thymi* occurred at Eaton, *Psallus varians* near Attleborough, and a curious little beast that Mr. E. A. Butler thinks must be the developed form of *Plagiognathus saltitans* on the Winterton sand-hills. The common *Bythoscopus flavicollis* was beaten from bushes at Hickling, with *Eupteryx atropunctata* at Horning.

The Neuroptera were yet more disappointing, for more was expected of them than *Ischnura elegans*, which literally swarmed everywhere, and of which both the female forms were taken: *Colpotaulius incisus* and *Chrysopa perla* were also found. The only uncommon Trichopteron was *Limnophilus hirsutus*, which was not rare, with *L. sparsus* on alder trunks at Rockland. *Cloëon dipterum* flew on to my coat, and was easily boxed without dismounting at Acle Bridge, while *Orthetrum cancellatum* was swept up at dusk in the Hoveton Marshes.

With a genial atmosphere the result would doubtless have been more congenial, and the real less unlike the ideal to which we, in our innocence of previous experience, had aspired; nevertheless the game was doubtless worth the candle, the length of which becomes considerable at Broadland hostelries!

41, Holland Park, W.: Nov. 1901.

UNDESCRIBED INDIAN RHYNCHOTA: PENTATOMIDÆ.

By W. L. DISTANT.

BONACIALUS, gen. nov.

Body elongate; head large, longer than broad, somewhat broadly rounded in front, distinctly depressed before apex, the lateral margins a little amplified and recurved; the lateral lobes longer than the central lobe and meeting beyond it, but a little cleft at their apices, the antenniferous tubercles remote from the lateral margins, and distinctly inside the longitude of the eyes; antennæ five-jointed, first joint short, incrassated, second joint not reaching apex of head, third shortest; rostrum reaching the posterior coxæ; eyes touching the anterior angles of the pronotum; pronotum broader than long, lateral margins a little sinuate, lateral angles rounded; scutellum more than half the length of abdomen, narrowed towards apex; corium with the lateral margins almost perpendicular.

This genus, by the position of the antenniferous tubercles, must be placed in the division *Dymantaria* of the subfam. Pentatominae, a division only hitherto considered as containing Australian and Ethiopian genera.

Bonacialus Dixoni, sp. n.

Ochraceous, very coarsely darkly punctate; head with the central lobe and base more or less levigate; pronotum with the margins narrowly levigate, the lateral areas more thickly and the central area much less punctate; scutellum with a large levigate spot near each basal angle and a central levigate fascia not quite reaching apex; corium thickly punctate, with its lateral margins very narrowly levigate; membrane pale hyaline; body beneath as above, the legs impunctate, a small black spot at bases of coxæ, a similar spot near apices of femora beneath, and the stigmata, black; lateral areas of the abdomen less punctate than on disk; antennæ darker ochraceous, apex of rostrum piceous. Long. 11 millim. Exp. pronot. angl. $4\frac{1}{2}$ millim.

Hab. Bombay Presidency; Bor. Ghat. (Victoria and Albert Museum).

Gulielmus, gen. nov.

Body elongate; head large, longer than broad, narrowing to apex which is subacute, distinctly depressed before apex, lateral lobes much longer than central lobe and meeting beyond it, their apices slightly cleft, antenniferous tubercles remote from the lateral margins, distinctly inside the longitude of the eyes, antennæ five-jointed, basal joint incrassated, second joint not reaching apex of head, fourth joint a little shortest; rostrum about reaching posterior coxæ; pronotum broader than long, lateral margins obliquely straight, lateral angles rounded; scutellum long, broad, a little narrower at its apical half, extending to or reaching a little beyond the apical angles of the corium; connexivum exposed.

Allied to the preceding genus *Bonacialus*, from which it differs by the differently-shaped head, pronotum and scutellum, &c.

Gulielmus laterarius, sp. n.

Ochraceous, thickly and darkly punctate; corium tinged with carmine-red; extreme margins of head and a small spot at apex of scutellum, black; two small obscure fuscous spots on anterior area of pronotum; scutellum with an elongate levigate spot outwardly margined with black at each basal angle and a central levigate line; corium with the outer margin and veins ochraceous; membrane pale greyish; inner margin of connexivum piceous; body beneath ochraceous, head and sternum somewhat thickly, abdomen more sparingly punctate, a longitudinal black punctate fascia on each lateral area of the abdomen; apex of rostrum, and apical joint of antennæ—excluding base—fuscous. Long. 9 to 10 millim. Exp. pronot. angl. $3\frac{1}{2}$ to 4 millim.

Hab. Bombay Presidency; Bor Ghat. (Victoria and Albert Museum).

Gulielmus marmoratus, sp. n.

Closely allied to the preceding species, but differing by having the surface of the pronotum and scutellum distinctly rugulose, the scutellum distinctly broader, the corium concolorous, and the punctures more profound. Long. $8\frac{1}{2}$ to 9 millim. Exp. pronot. angl. $3\frac{1}{2}$ millim.

Hab. Bombay Presidency; Bor Ghat. (Victoria and Albert Museum).

NOTES AND OBSERVATIONS.

ACHERONTIA ATROPOS IN SOUTH AFRICA.—Relative to the note on the rearing of *Acherontia atropos* (*ante*, p. 227), I should like to give my experience with the species in this country. I may first of all mention that the insect is certainly double-brooded, and possibly there are three broods in a year; also that by far the greater number of the larvæ I have found (at least thirty) are of the brilliant yellow form. Last January I found fourteen nearly full-grown larvæ, and after allowing them to pupate, I did as collectors often do in England, turned up the pupa out of the soil. All were perfect, except one crippled in changing, and two others which were evidently ichneumonised, as I found them almost rotten and covered with maggots. From the eleven perfect pupæ I only obtained two perfect specimens and one cripple; all the others died. In May, 1901, I had seven fine full-grown larvæ, which I put in a large five-gallon paraffin tin, with at least ten inches of slightly moist sand; all these went down to pupate by May 26th, and were left undisturbed. The result has been most satisfactory, as I have reared all, and only one was slightly crippled. They all came out in September: two on the 7th, one on the 9th, the cripple on the 13th, one on the 16th, one on the 19th, and one on the 20th. All the specimens are slightly smaller than my British ones, but this may be because they are the second brood. I do not know how it would answer in England to leave the pupæ alone, but here it is certainly better not to disturb them. The two perfect specimens which I bred from the January lot emerged, one on the 18th and the other on the 25th of February, and were only in the pupa state about twenty-one days; the second lot were about four months. Of course there was no forcing here, and I did not even damp the sand at all, in fact the tin was not moved until all the moths had emerged. On turning out the sand I found the empty cells were almost on the bottom of the tin, and there was at least ten inches of sand in the tin; this gives some idea of the depth these larvæ will go. In all cases where the cells were not entirely destroyed when turning out the sand, they seemed much larger than necessary for the pupæ. I may also mention that I never heard the slightest sound from the eleven pupæ I turned up, and, with the exception of one that was ichneumonised, found last year, I have not heard any sound from the larvæ. Food-plants here are numerous. I fed the larvæ I had upon sweet potato and tomato leaves, but they also eat a very large-leaved thistle, and a small-leaved climbing plant. I have also found one on a kind of bramble. In any case the larvæ are very common, and considering that so many are the very conspicuous yellow form, I wonder they are not more ichneumonised than they are. I tried to get a pairing, keeping two males and a female alive for that purpose, but without success; I fed them on moist sugar and a little water. All these three cried together, whenever I went to the box they were in, and they are alive now at the time of writing.—G. F. LEIGH; Musgrave Road, Durban, Natal, Sept. 21st, 1901.

GYNANDROMORPHISM IN LEPIDOPTERA.—A theory was put forward by Herr Dorfmeister (*Stett. Ent. Zeit.*, 1868, p. 181) that a mixture of th

sexes takes place whilst the ovum is being developed, that is to say, part of a male and part of a female germ come together in the formation of the egg which is destined to produce a gynandromorphous specimen of Lepidoptera. Consequently, he supposes that whenever one such specimen is produced in a brood, there should be another similar one resulting from the other parts of the two germs. As a test of the soundness of his hypothesis, he suggested that experiments should be tried by breeding whole broods from the egg of such species as *Oenaria dispar* and *Lasiocampa quercifolia*, of each of which several gynandromorphous specimens have been recorded. The results obtained by Messrs. Harrison and Main, who, it will be remembered, reared no less than seven gynandrous specimens of *Amphidasys betularia*, together with some sixty normal male and female examples, from one batch of ova (*ante*, p. 203), would seem to indicate that Dorfmeister's theory is worthy of more attention than it seems to have received. A significant fact is, that of the seven gynandrous examples four are male on the right side and three are male on the left side. With regard to the term "hermaphrodite," so often used in referring to specimens of Lepidoptera in which the colours and ornamentation of both sexes are represented, the late Prof. Westwood (*Trans. Ent. Soc. London*, 1880, p. 113) remarked:—"The term Gynandromorphism was first applied by M. Lacordaire to supersede in Entomology that of Hermaphroditism, the latter term being more strictly applicable only to those animals in which the generative organs of both sexes are normally included in the same individual, but which, nevertheless, require the presence of a second individual of the same species to effect the joint impregnation of the two individuals. In insects, gynandromorphous specimens, partaking abnormally of the character of both sexes, are generally bilateral; the sexual distinctive characters (which are for the most part in these instances the *secondary* ones) of one sex being exhibited on one side of the body and its organs, and the peculiarities of the opposite sex being seen on the other half of the insect. Of this bilateralism many instances have been recorded, and most extensive collections can boast of the possession of one or more of such 'half and half' monsters. Here the gynandromorphism may be termed *complete*, but specimens of far greater rarity, in which the abnormality is only *partial* (of which no notice occurs in any of the hitherto published introductions or general works on the science), are now known; and in my *Thesaurus Entomologicus* I collected together a number of instances in which, whilst the body of the insect appears to be unisexual, the partial sexual divarication is confined entirely to the *secondary sexual characters* exhibited by one or more of the wings only. The peculiar import of this strange modification, in a physiological point of view, is very difficult to be understood, and from the great rarity of the individuals, and their small size, we can hardly hope to obtain specimens sufficient for the necessary examination of the characters of the primary and internal sexual organs."

NOTES ON THE LARVA OF EUPITHECIA SUBFULVATA.—*E. subfulvata* is not an uncommon insect; but, like other "pugs," it is by far the best when bred, and it is possible that some of your readers may care for a few hints on the way to find the larva. I was first introduced to it

years ago by my friend the late Rev. G. A. Smallwood, in company with whom I found it on a railway embankment between Burton-on-Trent and Derby; and this year I have again found it in Shropshire. The larva feeds on the leaves of the common yarrow (*Achillea millefolium*), and is full-grown during the month of October. It is light brown in colour, somewhat variable, but generally having "chevrons" of a darker brown along the back. Mr. Smallwood led me to think that it preferred to rest upon the flowering stems, but this I find on a closer acquaintance is by no means always the case, as I found it here stretched at full length along the midrib of a leaf, and in some cases on withered leaves, in which position of course it is anything but conspicuous. And sometimes, too, it curls itself into that graceful shape known, I believe, as that of the "*ionic volute*," this being especially the case when it rests on the flowering-stems. Sunny banks under hedgerows, particularly where the soil is sandy, appear to be the favourite locality, and it was in such situations that I found most of mine this month, though I went rather too late, *viz.* on the 23rd; and there was plenty of evidence that I should have done much better a week or ten days earlier. However, this will be a hint for another season, and I hope to profit by it. Perhaps some of your readers, especially among the younger "hands," may do the like. I should like to add that this larva presents a striking example of "protective coloration," its appearance both when curled up and stretched out at full length being remarkably like that of the brown and withered leaves so frequently seen upon the plants of yarrow.—(Rev.) CHAS. F. THORNEWILL; Calverhall Vicarage, Whitchurch, Salop, Oct. 24th, 1901.

EVOLUTION IN BUTTERFLY SCALES.—At a meeting of the Manchester Microscopical Society, held on November 7th, at the Grand Hotel, Manchester, Mr. Mark L. Sykes, F.R.M.S., read a paper on "Evolution in Butterfly Scales." With reference to butterflies, he said that in whatever direction the mimicry may tend, whether in simulation of inanimate objects, such as leaves or twigs or moss, for concealment from their enemies on the one hand, or to enable them to more easily secure their prey on the other—in mimicry of conspicuously marked or highly-coloured inedible by edible species, in resemblance between two or more equally distasteful but entirely different species, or whatever purpose the mimicry may serve—it seems that the resemblance is in outward appearance only. Although the similarity in colour pattern and markings may be so close as to be almost identical, microscopical examination of the wing scales of these insects shows that the details by which the likenesses are brought about may be, and often are, widely different. The specimens from which the examples have been taken fall under two groups of mimicry—that of Müller and that of Bates. The Müllerian form of mimicry is that in which two or more highly coloured, conspicuously marked, or peculiarly shaped butterflies, all inedible and distasteful to the insect-eating animals, are so closely alike as to be easily mistaken one for the other. These by their similarity in appearance afford each other mutual protection, by dividing between them the total number destroyed by the young insectivora of each season in learning what is and what is not good for food. The Batesian mimicry is that in which certain of the con-

spicuous and nauseous species, which the young birds, &c., quickly learn are distasteful, are simulated by others which are not nauseous, but which have acquired the colours and markings of inedible forms, and are thereby protected. Amongst the former are the *Heliconinæ*, *Danainæ*, and *Acraeinæ*, all of which include amongst their members great numbers of highly coloured species, conspicuous for their markings in red, yellow, black, and blue, with a variety of intermediate tints and shades, and which are easily distinguished in their surroundings. In the latter are included butterflies of nearly every sub-family, and some of the diurnal moths, and both are found nearly all over the world. But on examining, with the microscope, the scales on the wings of these mimetic butterflies, it will be found that, so far from the similarity in superficial appearance being produced by similarity in detail and pattern, there is a wide diversity in scale-structure and arrangement. The scales vary not only in number, but in size, colour, and form, and this is the case even where one inedible species mimics another.

CAPTURES AND FIELD REPORTS.

PIERIS DAPLIDICE IN SUSSEX.—While collecting on the downs near Brighton, on Aug. 20th last, I took a fine male *P. daplidice* on the wing. On Aug. 21st I revisited the same spot, and took a very ragged female specimen. Three days later I took another fresh male example, not far from where the others were taken. Both the males are in perfect condition, but the female has not a single perfect wing. All three I observed and took on the wing.—H. HYAMS; 24, Bloomsbury Place, Brighton.

ARGYNNIS AGLAIA VAR. *CHARLOTTA*.—On July 7th last, while collecting on the downs near Brighton, I had the good fortune to take a fine *A. aglaia* var. *charlotta*.—H. HYAMS; 24, Bloomsbury Place, Brighton.

COLIAS HYALE, *C. EDUSA*, &c., AT FOLKESTONE.—The small visitation we had here of *C. hyale* this season seems to have confined itself to the grassy hillsides on the downs. They were not numerous, even in August, and I did not see one in the clover or lucerne fields in which there were so many last year. On Oct. 10th I found it again on the downs here, and I saw several males and one female; I went home for my net, and succeeded in taking two males, one of which was perfectly fresh and lately emerged, the other very slightly chipped. They must, I think, have all emerged since the wet and stormy weather which ended on Oct. 18th, and were probably a third brood. Is not this unusual in *C. hyale*? On Oct. 22nd some were still there, and again on the 23rd, on which day I saw two *C. edusa*, the only examples I have seen here this season. One I took was rather worn, and I released it. Here we occasionally have an autumn emergence of *Lycæna minima*; I took several, rather small and pale, on Aug. 21st, 1900. I took also *Nisoniades tages* here on Aug. 9th last, in fairly good condition, but small and pale.—PERCY E. FREKE; 7, Limes Road, Folkestone, Oct. 30th, 1901.

ABERRATIONS OF COLIAS HYALE AND GONOPTERYX RHAMNI.—I have recently added to my collection a remarkably interesting *C. hyale* ab.; all the usual black markings are replaced by a pale bright lilac shot with gold, producing a fine opalescent effect; the central spot on the secondaries is of a richer orange than in normal specimens; the usual dusky markings on the under side are in this specimen rose-pink, and the antennæ, costal and hind margins are of a brighter pink. It is a male, with a bright yellow ground colour, in very perfect condition, obviously freshly emerged. This beautiful insect was captured Sept. 1st last, at Sheerness, Kent, by Mr. E. Griffiths, who most kindly presented it to me. I am also indebted to him for a very fine *Gonopteryx rhamni*, which he likewise captured at Sheerness, on Aug. 28th, 1900. It is a male, having the right secondary of female colouring, excepting a narrow streak of yellow of the male running across the centre of the wing from the base to hind margin; the under side of the left primary is also of female colouring. Unfortunately, this rare specimen got considerably damaged in transit through the post, but with care I have been able to restore it to a very fair example.—F. W. FROHAWK; November, 1901.

ARGYNNIS LATONIA IN DORSETSHIRE.—A specimen of *A. latonia* was taken near Poole last season, by Mr. R. L. Thompson, of Warwick.—G. E. J. CRALLAN; Bodorgan Manor, Bournemouth.

VANESSA ANTIOPA IN HUNTINGDONSHIRE.—While collecting in Huntingdonshire, on a very hot day in July, I happened to go into a wayside inn for some light refreshment. The publican, seeing my net, said he had got "two butterflies." He fetched the nail-box, in which he kept them, and lying among the nails were *Vanessa antiopa* and *Charo-campa elpenor*. The publican informed me that he had caught *antiopa* in his garden the year before, "when the fruit was ripe." Considering the box it had been kept in, it was in remarkably good condition. It had been caught by the rough and ready method of a hat.—W. G. THEOBALD; Wolverhampton.

CHRYSOPHANUS PHLÆAS VAR. SCHMIDTII NEAR PAISLEY.—A good specimen of this little butterfly, with the ground colour of the wings white, instead of the usual copper tint, was taken near this town last September. I see the same variation referred to by Newman. The specimen was in my possession for a few days and was exhibited at our local societies' meeting in October.—A. M. STEUART; 28, Ferguslie, Paisley, N.B.

CATOCALA FRAXINI IN SUFFOLK.—My friend Mr. Jos. F. Green informs me that he captured, at sugar, a finely coloured *C. fraxini*, on Aug. 24th last, at Wrentham, Suffolk.—F. W. FROHAWK.

AUTUMNAL EMERGENCE OF LOPHOPTERYX CUCULLIA AND ACRONYCTA MENYANTHIDIS.—In the spring of this year I received about forty eggs of *L. cucullia* from West Sussex, which hatched in due course, and the larvæ fed up on maple with a very small percentage of losses, and the first commenced to prepare for pupation on July 5th, the remainder following suit within the next week or so. Ten perfect moths emerged between the 24th and 31st July. Assuming that the first to pupate was the first to emerge, the pupal stage occupied just nineteen days.

A. menyanthidis larvæ were full-fed on July 24th, and a somewhat undersized but otherwise perfect imago came forth on Nov. 3rd. In both cases the larvæ and pupæ were kept out of doors, but to some extent protected from the weather, both as regards the sun's rays and rain.—ROBT. ADKIN; Lewisham, November, 1901.

LYCENA ÆGON AND L. ASTRARCHE (MEDON) IN CORNWALL.—On June 14th I took a large number of *L. ægon* on the north coast of Cornwall. I worked a district for about an hour and a half, and took only three specimens, but eventually happened on a sheltered valley where they positively swarmed. I stayed until sundown, and it was a glorious sight to see them asleep on the grass-stems, and from which I took a few beautiful females, which appeared to be rather scarce on the wing. On examining my captures at home I found one undoubted specimen of *L. medon*, in grand condition. Both upper and under sides are quite distinct from *L. ægon*. The latter (*L. ægon*) has been found in considerable numbers in several districts within a couple of miles of the city.—W. A. ROLLASON; The White House, Truro, October, 1901.

ACHERONTIA ATROPOS IN DURHAM.—*A. atropos* has been unusually abundant in the larval state about here; several examples have been brought to me, and I have heard of others. The imago has also occurred. A larva was found on Sept. 14th, and an imago was taken on the same day; the latter was obtained on the fish-quay.—JOHN E. ROBSON; 15, Northgate, Hartlepool.

SPHINX CONVULVULI IN NORTHUMBERLAND.—Larvæ of *S. convolvuli* have been common this year. One Northumberland collector took over fifty, on a hedge grown over with *Convolvulus sepium*.—JOHN E. ROBSON; 15, Northgate, Hartlepool.

SPHINX CONVULVULI IN HAMPSHIRE.—Just a note to say that *S. convolvuli* has been very plentiful here this season; ninety-two have been taken up to the present, my contribution to that number being forty-two. Condition being so good makes one believe they have bred here this season.—W. G. HOOKER; Old Christ Church Road, Bournemouth, Sept. 26th, 1901.

MANESTRA ABJECTA AND SPILODES PALEALIS AT ROMFORD. —It may be of interest to record the capture of *M. abjecta* in my garden, in August last. I always thought this was a coast insect, but we are about twenty miles from the Thames, and it could not have flown far, as it is a fresh specimen. *Spilodes palealis* is also taken here, which I also understood to be a coast insect.—(Rev.) W. CLAXTON; Navestock Vicarage, Rumford, Essex.

XANTHIA GILVAGO AT BALHAM.—I took a rather worn specimen of this species at electric light in the town, on Oct. 2nd last.—E. C. GOULTON; 4, Cornford Grove, Balham, S.W.

NOTES ON SPILOSOMA (ARCTIA) FULIGINOSA. —In May I obtained forty-eight ova from a fine female *Arctia fuliginosa* which I found here. The eggs all hatched. I gave twelve larvæ to a friend; from the rest I have obtained thirty imagines, of which two are the var. *borealis*, besides other minor varieties, and I have one pupa and three larvæ hybernating.—G. E. J. CRALLAN; Bodorgan Manor, Bournemouth.

ODONATA AND LEPIDOPTERA AT WATFORD, HERTS.—During a stay at Watford in the first half of August, I observed the following dragonflies in the neighbourhood:—*Æschna grandis*, two; one in Cassiobury Park, and the other a few miles off. *Æ. cyanea*, one, near Watford. *Sympetrum striolatum* = *vulgata*, two, near Tring. I had never seen *Lycana corydon* on the wing, and Mr. Arthur Cottam, of Watford, very kindly introduced me to thousands of the butterfly near Tring, on Aug. 8th. Another butterfly I had never seen before alive was *Hesperia comma*, flying commonly enough with *L. corydon*, *L. agestis*, and *L. alexis*. Other Lepidoptera on the same habitat were *Gonopteryx rhamni* (one, just out), *Eubolia bipunctaria*, and a specimen of *Zygana filipendulæ*, which is an intergrade form midway between the type and the variety *cerinus* (Robson) with pale yellow spots and secondaries. It was as follows—Primaries: basal spots normal in colour; succeeding spots gradually paler until terminating with the marginal one pale yellow. Secondaries normal. Other butterflies I noticed in the Watford district were *Vanessa atalanta*, one. It seems as if it were not going to be an *atalanta* year, though I believe the species is not so common here as at Chester. *Thecla w-album*, several individual specimens near Watford, and one in the town itself, *L. argiolus* (getting over), *Epinephele ianira*, *Polyommatus phleas*, *Cænonympha pamphilus* (not so large or so bright in colour as our Delamere and North Wales specimens), and a few final examples of *E. tithonus*. I kept a sharp look-out for *Colias edusa* and *C. hyale*, but saw neither. Common “whites,” probably all or chiefly *Pieris rapæ*, were plentiful through the district. The weather all along was very warm and sunny until the 14th, when it broke up with copious showers.—J. ARKLE; Chester.

NOTES ON LEPIDOPTERA FOR SEPTEMBER, 1901.—The second brood of *Smerinthus populi* larvæ, which, as I previously mentioned (*ante*, p. 258), emerged from the ova on August 5th, have fed up very slowly, and at the time of writing, out of thirty that I kept (having given away the remainder), only seven have yet pupated. The first brood not only fed up much more quickly, but also seemed more brisk and lively: is the difference owing to the change in temperature? A brood of *Amphidasys betularia*, from ova laid by a black female, have successfully come through, but, curiously enough, one solitary larva, though apparently full-grown like the rest, went on eating for twenty-four days after the others had gone down to pupate, and it was only on Sept. 21st that he disappeared. On Sept. 4th I took a specimen of *Epinephele ianira* with a large patch of white on the left upper wing. It is not in perfect condition unfortunately, but it is good enough to set. It is a male, and the white patch is about the size of that on the right upper wing of the variety figured in Newman's ‘British Butterflies.’ The other three wings are, however, perfectly normal.—F. A. OLDAKER; Parsonage House, Dorking, Sept. 23rd, 1901.

LEPIDOPTERA AT FARNBOROUGH, KENT, AND NEIGHBOURHOOD.—Compared with last year, this season's collecting is almost nil. All through the summer “sugar” seems to have had no attraction whatever. Some evenings, in fact, with every appearance of being most favourable, have produced nothing. Last night (Sept. 23rd) I sugared about fifty trees, &c., and examined them all five or six times, the net

result being *two earwigs* and one "daddy longlegs"; last year at the same time and on the same trees the following were positively swarming:—*Amphipyra pyramidea*, *Anchocelis pistacina*, *A. lunosa*, *A. litura*, *Xanthia citrugo*, *X. fulvago* and var. *flavescens*, *X. flavago* (*silago*), *Calymnia trapezina*, &c., with occasionally *Catocala nupta* and *Xanthia gilvago*. *Chariclea umbra* (*marginata*) came to "sugar" several times, also *Neuria reticulata*. I have "sugared" almost every night through the season, on all the "old" grounds, and the result is naturally disappointing. On the other hand, netting at dusk in the spring and early summer has produced fairly good results. *Asthena candidata* could be taken eight or ten with one sweep of the net at Derrick woods, *Macaria notata*, *Iodis lacteria*, *Tephrosia punctularia*, *Uropteryx sambucaria*, *Thyatira batis*, *T. deras*, *Dicramura furcula*, *Drepana falcataria*, *Cymatophora fluctuosa*, *C. duplaris*, genus *Zonosoma*, *Hecatera serena* (on fences), *Pterostoma palpina*, *Hylophila prasinana*, *H. bicolorana* (*quercana*), *Numeria pulveraria*, *Bupalus piniaria*, *Geometra vernaria*, *G. papilionaria*, and many others have occurred more or less in profusion. *Notodonta dodonea*, *N. chaonia*, and *Plusia moneta* I also had the luck to take several times; but, taking the season altogether, it has certainly not been a good one here.—ALFRED J. LAWRENCE; Bromley Common, Kent, Sept. 24th, 1901.

LEPIDOPTERA RHOPALOCERA OF PARIS.—The following is a list of the butterflies observed by me in the suburbs and environs of Paris during the months of June, July, and September, 1901:—JUNE and JULY.—*Papilio machaon*, two captured; one in the neighbourhood of the canal, Forest of Fontainebleau, the other at Courbevoie; others (or the same one on different occasions) seen flying over lucerne field at Courbevoie. *P. podalirius*, one seen, Forest of Fontainebleau. *Aporia crataegi*, common, especially in Forest of Fontainebleau; fairly common at Courbevoie and in Forest of St. Germain: by the end of June this species apparently disappears altogether. *Pieris brassicae*, fairly common. *P. rapae*, most abundant; perfect showers of them fluttering over the lucerne field at Courbevoie. *P. napi*, a few seen. *Synchlœa daphnide*, fairly common, Courbevoie. *Leucophasia sinapis*, two captured in Forest of St. Cloud. *Gonopteryx rhamni*, one female captured in lucerne field, Courbevoie. *Colias edusa*, a few seen; male captured at Courbevoie, female at Parc Maison Lafitte. *C. hyale*, two or three seen; both male and female noticed at Courbevoie. *Argynnis paphia*, captured at Chantilly; male and female also captured in Forest of St. Germain. *A. aglaia*, *A. adippe*, and *A. niobe* (one), captured at Chantilly. *A. euphrosyne* (one), captured in Forest of Fontainebleau. *Melitæa selene* (one), *M. cinxia* (one), and *M. athalia* (one), captured in Forest of Fontainebleau; several of the last-named at Parc Maison Lafitte. *Chrysophanus phloxas*, fairly common, Courbevoie and Parc Maison Lafitte. *C. xanthe*, one specimen, Parc Maison Lafitte. *Thecla w-album*, on privet blossom in Forest of St. Germain, common on wild thyme in Parc Maison Lafitte; the specimens rather worn in this last locality. *T. quercus*, four or five seen; two captured, Parc Maison Lafitte, where there are plenty of young oaks. *Polyommatus alexis*, common. *P. argiolus*, not rare, Forest of Fontainebleau and Forest of St. Germain. *Vanessa atalanta*, two or three seen, Boulevard Bineau, Neuilly, and Forest of St. Germain. *V. io*, two captured, Courbevoie.

V. cardui, one captured, Courbevoie. *V. urticae*, fairly common, Courbevoie, Parc Maison Lafitte, Forest of St. Germain. *V. c-album*, one or two seen; one in Rue des Dames Augustins, Neuilly. *Satyrus ianira*, common. *S. tithonus*, common (in July). *S. mæra*, a few seen in Forest of Fontainebleau; I did not succeed in taking any. *S. hyperanthus*, fairly common on one or two occasions, Forest of St. Germain, Parc Maison Lafitte. *Melanarge galatæa*, very common, Courbevoie, Parc Maison Lafitte, Forest of St. Germain. *Cænonympha arcantus*, common in Forest of Fontainebleau; also noticed, but more sparingly, in Parc Maison Lafitte and at Courbevoie, and in Forest of St. Germain. *C. pamphilus*, common and generally distributed, not so common at first; it would seem, as *C. arcantus*, more abundant in July. *Syrichthus alreolus*, two captured, Forest of Fontainebleau. *Pamphila syltæanus*, fairly common, Forest of Fontainebleau, Chantilly, Parc Maison Lafitte. *P. lineæ*, fairly common, Forest of Fontainebleau, Parc Maison Lafitte, Courbevoie, &c. SEPTEMBER.—*Colias edusa*, fairly common, Courbevoie. *C. hyalæ*, fairly common, Courbevoie (rather commoner than *C. edusa*). *Synchlœ daphidice*, fairly common, Courbevoie. *Pieris brassicæ* and *P. rapæ*, abundant, Courbevoie. *Vanessa io*, fairly common, Courbevoie. *V. c-album*, two captured, Boulevard Bineau, Neuilly. *V. urticae*, a few seen, Courbevoie. *V. atalanta*, one or two, Boulevard Bineau. *V. cardui*, two captured, Courbevoie. *Satyrus ægeria*, one seen, Versailles. *Argynnis latonia*, one seen, Courbevoie.—(REV.) F. A. WALKER; Dun Mallard, Cricklewood.

NOTES ON THE LEPIDOPTERA OBSERVED AT CHICHESTER AND NEIGHBOURHOOD IN 1901.—I might begin by saying that never in my remembrance has there been a worse season for Lepidoptera than the past. The first insect which emerged in my breeding-cage was a specimen of *Cucullia verbasci* on April 28th. On May 1st *Lycana argyolus* was seen flying in the garden, and was fairly abundant during the month. On the 20th *Bupalus piniaria* was taken by my friend Mrs. Fogden at Goodwood, near here. In the autumn of last year I took from a gas-lamp a female of *Ennomos autumnaria*, which deposited a large number of ova. These first hatched on May 28th. The larvæ were fed almost exclusively on oak. A little poplar was also given now and then. They were full-fed about the middle of July, the first pupating on the 20th of that month. From some unexplained reason the larvæ when quite full-fed began to die off. They remained in a rigid posture for days together, and died in this position, clasping the stems of the oak or poplar. Up to this time they appeared perfectly healthy. The first imago, a male, appeared on August 11th, and I subsequently obtained a good series of this once coveted and very beautiful "thorn." Early in June *Chelonia villica* were found, and a *Smerinthus tilia* emerged; a few days later *S. ocellatus*. On the 19th Mrs. Fogden took at sugar *Neuronia popularis* and *Miana strigilis*. I first met with *Anticlea rubidata* on July 3rd, which was almost the only geometer I obtained worth mentioning. On July 12th I saw a *Vanessa polychloros* flying in the garden; the first time I believe that I have seen it since 1878. On the 12th I took *Iodis vernaria*, beaten from clematis; on the 22nd *Aci alia emarginata*. On August 7th my first larva of *Acherontia atropos* was found on potatoes. In this month four *Colias hyalæ* were taken by my brother, Mr. Frederick Anderson, at clover.

During September a few more larvæ of *A. atropos* were met with, and on the 5th a pupa was sent me by Mrs. Fogden. On the 9th I took from a gas-lamp *Ennomos fuscantaria*, another on 13th, and a worn specimen on Oct. 1st. Sugar was a complete failure, the only insect worth naming attracted by it being *Catocala nupta*.—JOSEPH ANDERSON.

NOTES ON LEPIDOPTERA FROM PORTLAND.—Both broods of *Lycena argiolus* were out in fair numbers, but of *L. adonis*, *Colias edusa*, and *Vanessa cardui*, so plentiful here last season, I have only seen one of the last named. *Acidalia degenaria* I managed to find in two or three spots on the island and took a few, but they were mostly in poor condition. I was fortunate enough to discover a larva of *Cucullia absinthii* on the 31st August feeding on wormwood growing in my garden, and, from the knowledge of its appearance thus gained, was enabled to find between twenty and thirty others at home and afield, but they did not pupate satisfactorily. In the spring-time I took a hundred or so of *Epunda lichenea* larvæ, which fed well and appeared to go down all right; but when I looked for the pupæ, I found the bulk had entirely disappeared, from what cause I cannot say. *Helio-phobus hispidus* I found in its usual haunts in fair numbers. A few *Acrophyla australis* came to sugar, and in May I found about a dozen larvæ, from which I bred five imagines. More common insects have not been generally plentiful here this season. I had no difficulty in obtaining ova of *H. hispidus* and of *E. lichenea*, the former of which have just hatched.—Jno. T. HYDE; The Grove, Portland.

LEPIDOPTERA AT LIGHT IN HERTFORDSHIRE.—In continuation of my notes on Lepidoptera taken at light in this county during 1899 (*vide* Entom. xxxiii. pp. 92 and 93), I now give below a list of those I obtained from January 1900 to the end of September, 1901. During that period I captured rather more than two hundred and thirty different species within a short distance of our house. The majority were captured with a light-trap fitted to a first-floor window, and the remainder at an electric lamp in a garden close by. I do not have my trap fitted with any killing apparatus, so that any specimens not required can be liberated in the morning.

The best captures were as follows:—*Savothrips revayana* (*undulanus*), one. *Spilosoma menthastri*, a brown aberration. *Trichiura cratagi*, three males. *Luperina cespitis*, seven. *Apamea unanimitis*, one, *A. ophiogramma*, three. *Agrotis cinerea*, one male. *A. porphyrea* (*strigula*), one. *Orthosia suspecta*, one. *Calymnia pyralina*, fairly common. *Asteroscopus sphinx*, males fairly plentiful. *Plusia moneta*, four (also four more taken at dusk). *Spilodcs palealis*, one. *Galleria mellonella*, one.

The following is a list of the other species. The dates after the commoner species indicate the earliest and latest dates on which they were observed on the wing during the period dealt with.

Sphinxes:—Remarkably scarce, being represented by single specimens of *Sphinx ligustri* (an exceptionally large one), and *Smerinthus ocellatus*.

Bombyces:—*Hylophila bicolorana* (*quercana*), one. *Nola cucullatella*, June 30th—July 13th. *Lithosia griscola*, one. *L. lurideola*, July 7th—July 30th. *Euchelia jacobææ*, one. *Arctia caia*, few. *Spilosoma lubricipeda*, May 28th—July 3rd. *S. menthastri*, May 19th—July 13th.

Porthesia similis, July 15th—Aug. 24th. *Dasychira pudibunda*, one male. *Pacilocampa populi*, few. *Bombix nemoria*, July 20th—Aug. 16th. *Odonestis potatoria*, two males. *Lasiocampa quercifolia*, one, July 26th, 1900, which seems late. *Drepana falcatoria* (*falcula*), one. *D. binaria*, one. *Cilix spinula*, May 19th—Aug. 20th. *Pterostoma palpina*, June 5th—Aug. 12th. *Lophopteryx camolina*, June 14th—Aug. 19th. *Phalera bucephala*, June 3rd—July 18th. *Pygara curtula*, one. *Thyatira derasa*, three.

Noctuae:—*Bryophila perla*, July 14th—Aug. 16th. *Diloba cæruleocephala*, fairly common. *Leucania conigera*, July 5th—July 28th. *L. lithargyria*, June 20th—July 28th. *L. comma*, June 5th—July 24th. *L. impura*, July 6th—July 31st. *L. pallens*, June 18th—July 15th. *Gortyna ochracea*, one. *Hydracia nictitans*, July 24th—Aug. 23rd. *H. micacea*, July 27th—Sept. 22nd. *Axylia putris*, one. *Xylophasia lithoxylea*, four. *X. monoglypha*, June 22nd—July 31st. *Dipterygia scabriuscula* (*pinastris*), May 29th—July 13th. *Neuronia popularis*, males common, two females. *Cerigo matura*, three. *Luperina testacea*, Aug. 1st—Sept. 10th. *Mamestra brassicae*, May 29th—Sept. 9th. *M. persicaria*, June 30th—July 28th. *Apamea basilinea*, five. *A. oculus*, July 4th—Aug. 18th. *Miana strigilis*, June 9th—Aug. 16th. *M. fasciuncula*, one. *M. bicoloria* (*furuncula*), one. *M. areosa*, two. *Grammesia trigrammica* (*trilinea*), May 26th—June 27th. *Caradrina morpheus*, June 4th—July 27th. *C. alsines*, June 21st—Aug. 4th. *Rusina tenebrosa*, males common, two females; June 9th—July 6th. *Agrotis puta*, males common, two females, May 19th—Sept. 5th. *A. suffusa*, one. *A. segetum*, June 6th—June 25th. *A. exclamationis*, May 29th—July 6th. *Noctua augur*, June 20th—July 13th. *N. plecta*, six. *N. c-nigrum*, four. *N. triangulum*, three. *N. festiva*, June 14th—July 4th. *N. rubi*, three. *N. baja*, two. *N. xanthographa*, Aug. 10th—Sept. 14th. *Triphæna janthina*, July 25th—Aug. 22nd. *T. comes* (*orbona*), Aug. 6th—Sept. 11th. *T. pronuba*, June 7th—Sept. 6th. *Amphipyra tragopogonis*, Aug. 13th—Aug. 19th. *Mania typica*, three. *M. maura*, one. *Pachnobia rubricosa*, two males. *Taniocampa gothica*, April 15th—May 25th. *T. incerta* (*instabilis*), one. *T. stabilis*, April 30th—May 11th. *T. gracilis*, one. *Orthosia lota*, Oct. 11th—Oct. 20th. *Anchocelis pistacina*, Sept. 14th—Oct. 13th. *A. lunosa*, abundant; first seen Sept. 3rd. *Cerastis vaccinii*, Oct. 16th—Nov. 1st, 1900; and in January and March, 1901. *Scopelosoma satellitia*, Oct. 25th—Nov. 3rd. *Xanthia citrargo*, two. *X. fulrargo* (*cerargo*), Sept. 6th—Sept. 24th. *X. flavargo* (*silargo*), Sept. 11th—Sept. 24th. *X. gilrargo*, two. *X. ferruginea* (*circellaris*), fairly common. *Calymnia trapezina*, fairly common. *C. diffinis*, two. *C. affinis*, one. *Dianthæria capsicola*, one. *Hecatera serena*, two. *Miscia oxyacanthæ*, common. *Euplexia lucipara*, two. *Phlogophora meticulosa*, first seen July 3rd. *Hadena adusta*, one. *H. dentina*, June 1st—June 29th. *H. trifolii* (*chenopodii*), two. *H. oleracea*, June 9th—Aug. 9th. *H. thalassina*, one. *H. genistæ*, three. *Xylocampa lithoriza*, April 15th—May 23rd. *Habrostola tripartita* (*urticæ*), three. *H. triplasia*, two. *Plusia chrysis*, June 21st—July 4th. *P. pulchrina*, one. *P. gamma*, July 25th—Oct. 30th. *Catocala nupta*, one.

Geometræ:—*Uropteryx sambucaria*, July 1st—July 23rd. *Epione apiciaria*, two. *Rumia cratægata* (*luteolata*), June 4th—Sept. 1st.

Metrocampa margaritaria, one. *Pericallia syringaria*, three. *Selenia ilunaria* (*bilunaria*), four. Ditto, var. *juliaria*, July 22nd—Aug. 11th. *S. lunaria*, four. *Odontopera bidentata*, May 26th—June 15th. *Crocallis elingvaria*, July 24th—Aug. 24th. *Ennomos tiliaria* (*canaria*) July 26th—Sept. 16th. *E. erosaria*, one. *Himera pennaria*, Oct. 19th—Nov. 4th. *Amphidasys betularia*, one male. *Hemerophila abruptaria*, May 5th—May 24th. *Boarmia repandata*, one. *B. rhomboidaria* (*gemmaria*), males, July 3rd—Aug. 3rd, one female. *Geometra papilionaria*, two. *Phorodesma bajularia* (*pustulata*), one. *Iodis lactearia*, three. *Hemithea thymiararia* (*strigata*), ten, July 4th—July 19th. *Acidalia dimidiata* (*scutulata*), two. *A. bisetata*, July 6th—July 25th. *A. virgularia* (*incanaria*), several. *A. imitaria*, two. *A. aversata*, June 22nd—Aug. 15th. *Timandra amataria*, one. *Cabera pusaria*, June 5th—July 25th, including one female. *Bapta taminata* (*bimaculata*), one. *Halia wavararia* (*vauvaria*), July 6th—July 23rd. *Panagra petrararia*, few. *Abraxas grossulariata*, July 6th—July 23rd. *A. ulmata* (*sylvata*), one. *Lomaspilis marginata*, two. *Hybernica rupicaprararia*, males, Jan. 22nd—Feb. 23rd. *H. leucophæaria*, one male. *H. aurantiaria*, males, Nov. 3rd—Nov. 29th. *H. marginaria* (*progemmaria*), males, Feb. 24th—March 12th. *H. defoliaria*, males, Nov. 22nd—Dec. 1st. *Cheimatobia brumata*, males, Nov. 21st—Nov. 29th. *C. boreata*, one. *Oporabia dilutata*, Oct. 17th—Oct. 27th. *Larentia didymata*, four. *Eupithecia pulchellata*, three. *E. centaureata* (*oblongata*), June 15th—Aug. 24th. *E. subfulvata*, four. *E. nanata*, one. *E. subnotata*, July 11th—July 26th. *E. minutata*, one. *E. rectangulata*, June 5th—July 23rd. *Thera variata*, fairly common. *Hypsipetes elutata* (*sordidata*), July 17th—Aug. 17th. *Melanthia ocellata*, May 28th—Aug. 24th. *Melanippe subtristata* (*sociata*), May 26th—Aug. 17th. *M. montanata*, one. *M. fluctuata*, May 11th—Sept. 10th. *Anticlea badiata*, five. *A. nigrofasciaria* (*derivata*), four. *Coremia designata* (*propugnata*), eight. *C. ferrugata*, three. *C. unidentaria*, six. *Cidaria truncata*, several. *C. testata*, one. *C. fulvata*, July 13th—July 23rd. *C. pyraliata*, (*dotata*), two. *C. associata*, June 14th—July 23rd. *Pelurga comitata*, July 19th—Aug. 18th. *Eubolia cervinata*, two. *E. plumbaria*, two. *Anaitis plagiata*, one. *Chesias spartiata*, one.

Deltoides:—*Hyphenia proboscidalis*, three. *Herminia tarsipennalis*, June 24th—July 15th. *H. grisealis* (*nemoralis*), three.

Pyralides:—*Pyralis costalis* (*fimbrialis*), June 30th—Aug. 23rd. *P. farinalis*, two. *P. glaucinalis*, July 14th—Aug. 9th. *Scoparia cembra* var. *zelleri*, one. *Pyrausta purpuralis*, two. *Endotricha flammealis*, July 13th—Aug. 24th. *Hydrocampa nymphaeata*, three. *H. stagnata*, one. *Botys hyalinalis*, two. *B. ruralis*, July 19th—Aug. 24th. *B. urticata*, two. *Ebulea sambucalis*, June 5th—July 25th. *Pionea forficalis*, May 19th—June 21st, and July 25th—Aug. 24th. *Scopula olivalis*, one. *S. prunalis*, July 3rd—Aug. 6th. *S. lutealis*, one.

Crambi:—*Crambus pratellus*, one. *C. pascuellus*, two. *C. perlellus*, one. *C. tristellus*, Aug. 6th—Aug. 24th. *C. geniculeus*, few. *C. hortuellus*, six.

Phycitidæ:—*Hypochalcia ahenella*, one. *Aphomia sociella*, three males.

Pterophori:—*Alucita hexadaetyla* (*polydaetyla*), May 11th—June 5th. *Aciptilia pentadaetyla*, two.

Tortrices :—*Tortrix podana*, June 28th—July 25th. *T. heparana*, one. *T. ribeana*, three. *T. forsterana*, three. *Teras contaminana*, one. *Penthina ochroleucana*. June 21st—July 14th. *P. betulatana*, one. *Spilonota rosaccolana*, three. *S. roborana*, fairly common. *Pardia tripunctana*, one. *Aspis udmanniana*, six, June 30th—July 16th. *Sciaiphila subjectana*, few. *Xanthosetia zayana*, three. *X. hamana*, two.—
 PHILIP J. BARRAUD; Bushey Heath, Herts.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—*October 16th, 1901.*—Mr. E. Saunders, Vice-President, in the chair.—M. J. H. Fabre, of Sérignan, Vaucluse, France, was elected an Honorary Fellow of the Society.—Mr. W. Schaus, F.Z.S., of Trentham House, Twickenham, was elected a Fellow of the Society.—Mr. C. Morley exhibited, for the Rev. E. N. Bloomfield, leaves of hornbeam from Battle, and a photograph of leaves of sweet chestnut from Haslemere, rolled by *Attelabus curculionoides*. The former were not rolled by reason of a scarcity of their usual oak, which abounds in the locality.—Mr. R. Adkin exhibited a specimen of *Pieris daplidice* taken by him at Eastbourne on August 19th last. He said that the insect was flying strongly, and in that respect and indeed in general appearance resembled on the wing a pale female of *Colias hyale*. Mr. Rowland-Brown asked if there were any records of recent date of the discovery of the larva in this country, and with Mr. A. H. Jones corroborated the swift habit of flight in the species. In the discussion upon immigrant species that followed, Mr. R. McLachlan said that the recent observations of *Papilio machaon* in various parts of the country seemed to suggest immigration on the part of a species not usually regarded as migratory. He also said that he knew of no reliable evidence of the larva of *Pieris daplidice* having occurred on this side of the Channel.—Mr. C. P. Pickett exhibited a series of *Melitæa cinxia* bred in June last from larvæ taken in the Isle of Wight, including light and dark varieties of the females, one male with extra light upper wings, and one male with the lower wings almost black. He also exhibited a series of *Charocampa elpenor*, bred in June last from larvæ taken at Broxbourne in July, 1900, including a variety of the male with purplish lower wings, and another with purple markings on the upper wings.—The Rev. F. D. Morice exhibited specimens of *Hedychrum rutilans*, Dhl., and *Salix propinquus*, Lep., taken at Lyndhurst by Miss Ethel Chawner, and both new to the British list. He also exhibited two monstrosities, viz.—*Allantus arcuatus*, male (sawfly), having on the left side two perfect and two other rudimentary wings, and *Gorytes quinquecinctus* (fossor), with the abdominal segments extraordinarily twisted out of their proper shape and places.—Mr. E. Saunders said that these specimens appeared to him identical with Continental *propinquus*, which was not rare in the south of Europe, where it was sometimes black, and sometimes red towards the middle of the abdomen, but that he thought it could not be a variety of any British species, as we have no species with a rugose propodeum which could agree with it.—Mr. Arthur M. Lea communi-

cated "A List of the Australian and Tasmanian Mordellidæ, with Descriptions of New Species"; and Mr. Edward Meyrick, B.A., F.Z.S., "Descriptions of New Lepidoptera from New Zealand."—Mr. E. Saunders then read a paper upon "Hymenoptera Aculeata collected in Algeria by the Rev. A. E. Eaton, M.A., and the Rev. F. D. Morice, M.A.; Pt. I.—Heterogynæ and Fossores to the end of Pompilidæ."—H. ROWLAND-BROWN, *Hon. Sec.*

SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—September 18th, 1901.—Mr. W. J. Lucas, B.A., F.E.S., Vice-President, in the chair.—Mr. F. M. B. Carr exhibited a varied series of *Cidaria truncata* from Porlock, North Somerset, taken among bilberry. No specimens of the yellow form were seen.—Mr. Lucas, two specimens of the rare dragonfly, *Libellula fulva*, taken near Christchurch by Major Robertson.—Mr. Bishop, a bred series of *Eugonia polychloros*, from ova seen deposited naturally in the open by a female in the New Forest.—Mr. R. Adkin, a specimen of *Cossus ligniperda*, bred from a larva captured and then placed in a tree in his garden; and a series of *Boarmia consortaria* reared from Abbots Wood pupæ, remarking on the scarcity of the species for some time till the last two years.—Mr. Kemp, two specimens of *Sphinx convolvuli* taken at Hythe, near Southampton.—Mr. Colthrup, a nice series of *Colias hyale* from Margate; *Triphana orbona*, from Deal, showing red forms of various intensity; and a very variable series of *Triphana fimbria* from the Isle of Wight.—Messrs. Harrison and Main stated that they had taken some ten specimens of *S. convolvuli* at lamps at Forest Gate. Mr. McArthur said that the species was common at Brighton.

October 10th.—Mr. F. Noad Clark, Vice-President, in the chair.—Mr. McArthur exhibited larvæ of *Triphana comes* in a novel cage adapted from one of the globular wire cages for catching flies.—Mr. Barnett, a variety of *Epinephale tithonus* with xanthic spots, and an unusually large and pale male of *Fidonia atomaria*, both from Oxshott.—Mr. Garrett, a long series of *Vanessa io*.—Mr. Kirkaldy, his collection of Nabinæ from all parts of the world, and called attention to its being especially rich in winged forms.—Mr. Kemp, a portion of broom-stem bored by the Coleoptera—*Hylastinus obscurus*, *Læmophlæas ater*, and *Phlæophthorus rhododactylus*, from Oxshott.—Mr. Adkin, a fine bred series of *Lophopteryx cuculla* (*cucullina*) from Sussex, and remarked that some of the pupæ were lying over.—Mr. Step communicated a short Report of the Field Meeting held at Oxshott on Oct. 5th, and gave a list of the fungi gathered.—Mr. South exhibited specimens of *Thyatira batis*, *T. cognata*, and *T. aurorina*, belonging to the Cymatophoridæ, together with *Risoba trimaculata* and *Cymatophoropsis sinuata*, belonging to the Stictopterinae; and contributed notes, especially with reference to the strong superficial resemblance between these two sets of species, although they belonged to two widely-separated groups of moths.—HY. J. TURNER, *Hon. Report Sec.*

BIRMINGHAM ENTOMOLOGICAL SOCIETY.—September 16th, 1901.—Mr. G. T. Bethune-Baker, President, in the chair.—Mr. John Levick, Jun., Livingstone Road, Handsworth, was elected a member.—Mr. G. H. Kenrick mentioned the occurrence of *Acronycta alni* at light at Edg-

baston; also of *Liparis salicis* at Edgbaston.—Mr. R. C. Bradley exhibited a small collection of insects made on the Lickey Hills on June 25th, including *Hecatera serena*, *Tinea semifulvella*, *Dioctria atricapella*, &c.—Mr. J. T. Fountain, a number of *Leucoma salicis* taken at Bournville, Lifford, &c., some having been found in Bournville station; he found them quite common in that district, obtaining many larvæ and pupæ from poplars.—Mr. G. H. Kenrick, two collections of Lepidoptera, one made near Bolt Head, Devon, during the first week in July, and the other from Tongue, in Sutherlandshire, during the middle of August. Amongst the former lot were *Sesia philanthiformis*, which was very common on the cliffs, *Heliothis peltigera*, *Agrotis lunigera*, *A. lucerneæ*, *A. corticea*, *Bryophila glandifera*, *Hecatera serena*, *Anticlea rubidata*, &c.; amongst the latter were *Epunda lutulenta* = ? var. *luneburgensis*, *Agrotis cursoria* (dark brownish forms), *A. tritici*, *Noctua festiva* var. *conflua*, *Polia chi* (with dark hind wings), *Xanthia cerugo* (lemon-coloured), *Stilbia anomala*, *Larentia casiata* (well marked), *L. flavicincta*, *Cidaria immanata* (fine forms, one with black bar), *Carsia imbutata*, *Larentia olivata*, &c. The larvæ of *Demas coryli*, he said, swarmed everywhere at Tongue.—Mr. G. W. Wynn, the following Lepidoptera, all bred from larvæ found in Wyre Forest last September: *Demas coryli*, *Drepana falcataria*, *Pygæa curtula*, *Orgyia pudibunda*, *Amphidasy betularia* var. *doubledayaria*, *Hadena contigua*, *Cerura bifida*, and *Ephyra pendularia*; also a few Diptera from Derbyshire—*Asilus crabroniformis*, *Tachina grossa*, *Chrysochlamys cuprea*, &c.—Mr. A. D. Timms, cocoons of *Attacus atlas* sent to the University Museum.—Mr. Colbran J. Wainwright, a few Diptera from Hay Woods, Warwickshire, taken July 28th: *Didea alneti*, *Chrysochlamys cuprea*, *Eumerus ornatus*, *Chilosia æstræa*; the last three had not previously been taken anywhere near Birmingham.—Mr. G. T. Bethune-Baker, a long series of *Lycæna arion* from many places, including a series taken by himself in Cornwall this year; some old Cotswold ones and various European specimens, including var. *obscura* from the High Alps. He pointed out a most decided difference in the colour between the Cornish and Gloucestershire specimens, the former showing a brighter, paler, more metallic blue; also he called attention to a gynandromorphous specimen amongst the Cornish ones.—Mr. W. Harrison, the following Lepidoptera:—*Leucophasia sinapis* and *Nemeobius lucina* from Witherslack, where they were common; *Cænonympha darus* from Westmoreland, which he pointed out were darker than Scotch forms he had, and not so red as Welsh ones; *Smerinthus ocellatus* from Harborne, where the larvæ were common in 1900, but none were seen in 1901; *Melanargia galatæa*, which was very abundant in the Cotswolds, Gloucestershire, wherever he went this year; *Hesperia comma*, common on one hill only in the Cotswolds; *Vanessa c-album* from Trench Woods and the Cotswolds, at both of which places it was common this year; and *Acidalia ornata* from Rodborough Hill, Glos.

October 21st.—The President in the chair.—Mr. R. Bradley exhibited *Anthrax paniscus*, males and females, taken last August at Criccieth, North Wales, in dull weather.—Mr. G. W. Wynne, a collection of Lepidoptera made at Wyre Forest, at sugar, on two evenings only, June 23rd and 24th last. He was unusually successful, the moths being in great numbers at every patch of sugar. They in-

cluded *Thyatira batis*, *T. derasa*, *Cymatophora duplaris*, *C. fluctuosa* (one), *C. or.* and *C. ocularis* (one), *Acronycta leporina*, *Xylophasia hepatica*, *Mamestra sordida*, *Agrotis exclamationis* (fine vars.), *A. cinerea*, *Aplecta herbida*, *A. tincta*, *Hadena contigua*, *Tephrosia luridata* (*extersaria*). Of these, *C. duplaris*, *T. extersaria*, *H. contigua*, and *A. tincta* were common, the last-named being a perfect nuisance; of *A. cinerea* he took one female, which in his experience was much rarer than the male, and he had never seen it at sugar before.—Mr. C. J. Wainwright, a specimen of *Protoparce convolvuli*, which had been sent to him from Wiltshire.—Mr. H. W. Ellis, the following Coleoptera:—*Silpha sinuata*, from Bewdley; *Galerucella tenella*, *Hydrochus elongatus*, and *Bagous cylindrus*, all from Bedfordshire, the latter species in some numbers.—Mr. J. T. Fountain, *Pieris daphidice* from Jersey in August last; bred series of *Selenia lunaria*, both spring and summer broods, for comparison; and a series of *Ennomos angularia*, bred from a Brockenhurst female.—Mr. A. D. Innes, the thysanuran *Machilis maritima*, from Port Erin, Isle of Man; they were common on the rocks and cliff-faces, and also came in to light at the biological station, and were common all over the house. *Anurida maritima*, also from Port Erin, August, 1901, a species of *Collembola* from rock-pools, &c., below high-water mark.—Mr. G. T. Bethune-Baker, a drawerful of *Cænonympha* from many localities, including *C. davus* var. *rothliebi* from Witherslack and Chartley Moss, and pale Continental forms. He said that though Barrett figures and describes the pale form of this species as a mountain form, yet in his experience it was the usual form on the Continent.—Mr. W. H. Flint read a very interesting paper upon the digestive tract in Lepidoptera. He gave an account of his own researches, illustrating them upon the blackboard, describing the form, functions, and variations, &c., of the digestive organs. Among other things, he mentioned that this spring he had a large brood of *Endromis versicolor*, which died without eating; upon dissection he found that the mesenteron and gnostodeum had never joined up, consequently there was no passage through.—COLBRAN J. WAINWRIGHT, *Hon. Sec.*

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY. — The first meeting of the Winter Session was held on October 14th, in the Royal Institution, Colquitt Street, with the Vice-President, Mr. R. Wilding, in the chair.—Dr. G. W. Chaster exhibited a collection of Southport Coleoptera, including at least forty species which have not yet been found in the Liverpool district. Amongst these may be mentioned, *Carabus glabratus* (probably introduced), *Hydrana nigrita*, *Phlaeopora corticalis* (both very rare), *Anisotoma picea* (hitherto only known from Scotland), *Antherophagus silaceus*, *Ammæcius brevis*, *Anthicus bimaculatus* (up to the time of capture of this species by Dr. Chaster and Mr. Tomlin, at Southport, only two specimens were known—see Dr. Ellis's Liverpool List), *Orthochates setiger*, *Ceuthorrhynchidius dawsoni*, and *Rhinonchus gramineus*. Mr. Wilding heartily congratulated Dr. Chaster on the addition of such rarities to the Lancashire fauna.—Mr. F. Birch, *Scarites gigas*, from West Africa; he also read a letter from Mr. E. J. B. Sopp, on the distribution of one of the rarer cockroaches, *Periplaneta australasiae*, specimens of which were exhibited.—Mr. Oulton Harrison, a living larva of *Lampyrus noctiluca* from Delamere Forest.—Mr. Crabtree, a

portion of Mr. McArthur's collection of Lepidoptera from the Island of Lewis, including strange varieties of *Melanippe subtristata*,* *Boarmia repandata*, *Agrotis cursoria*, &c.; also a very curious diaphanous-winged specimen of the dark variety of *Odontoptera bidentata*, bred with others from Manchester larvæ.—Mr. J. Collins exhibited and described a fine melanic form of *Macaria liturata*, from Delamere, for which he proposed the varietal name *nigrofulvata*; also a fine collection of species of the genera *Xanthia* and *Dianthæcia*.—Mr. C. F. Johnson exhibited very fine series of *Thecla w-album*, *Macaria notata*, *Nola confusalis*, *Agrotis ashworthii*, *A. cursoria*, &c.—Mr. F. C. Thompson, bred specimens of *Triphana jimbria*, and said that according to his experience the larvæ were almost always found on bramble, and not on birch, as recorded in the books.—Dr. Cotton, a beautiful series of *E. octomaculata*.—Messrs. A. and H. Tonkin, captures in South Devon in May and June, including *Anticlea rubidata*, *Bapta taminata*, *Zonosoma omicronaria*, &c. Specimens of *Argynnis paphia* intermediate between the type and var. *valezina* from Beddgelert, *Venusia cambricaria*, and *Xylophasia scolopacina* from Barmouth, *Bryophila glandifera* and *Aspilates citraria* from the Welsh Land's End (St. David's Head), were shown by Mr. F. Birch.

November 11th.—Mr. R. Wilding, Vice-President, in the chair.—Messrs. Mallinson, Wynue, Dunlop and Harrison were elected members of the Society. The December meeting, which is to be held in Chester, was shortly discussed.—Mr. F. N. Pierce, F.E.S., read a paper entitled, "The Home of the Swallow-tails," which was illustrated by limelight views. After a short *résumé* of the notices of *Papilio machaon* scattered through the chief entomological literature of three centuries, he described its "habit, habits, and habitat." From his remarks upon the two latter we derived the cheering intelligence that in the Norfolk Broads, at all events, this splendid insect will not be exterminated for many a year to come. Its strong flight, for the most over swamps, the wide diffusion of its food-plant, *Daucus carota*, which carpets the ground everywhere, the consequent impossibility of its being all examined, and the possession by the larva of peculiar organs to drive away ichneumons and birds, all point to this conclusion. The habit of *P. machaon* is very constant, the essayist having seen but few remarkable varieties. One of these, in which the ground colour is deep yellow, he exhibited along with other fen species. During the discussion Dr. J. W. Ellis gave a short account of his fenland experiences. Mr. R. Wilding was confident that new species of all Orders awaited the enthusiastic worker in the fens.—Mr. E. J. Burgess-Sopp exhibited the very beautiful *Chrysomela cerealis*, along with many other rarities, and stated that he was elucidating the life-history of this gem from Snowdon's coronet, a work which he is the first to attempt, so far as is known. Dr. Ellis referred to the pleasure which the sight of this species, occurring suddenly in abundance on the mountain, had given to him.—Dr. J. Cotton exhibited Lepidoptera from Grange and the New Forest.—Mr. W. A. Tyerman, a beautiful series taken at Carrog, which included *Plusia interrogationis*, *Larentia cæsiata*, and *Noctua triangulum*.—Specimens of *Chlonius nigricornis*, from the banks of the river Gowy were shown, and their habits remarked upon by the Joint Secretary.—FREDK. BIRCH.

[* *Melanippe sociata* var. *obscurata*. See fig., Entom. xxi. p. 27.—ED.]

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ERRATA IN VOL. — Page 52, for Finns, read Imms; page 64, for ravana n. sp.,
 read ravana, *Kirk.*; pages 331 and 332, for Emmetica cervinata read Eubolia
 cervinata.

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SOME ABERRATIONS OF BRITISH BUTTERFLIES CAPTURED IN 1901.



I AM indebted to Mr. E. Sabine, of Erith, for a loan of the interesting specimens figured above.

Fig. 1.—*Argynnis aglaia* ♂. Taken by Mr. L. W. Newman, at Eynsford, last year. This example is somewhat similar to an aberration of the female of *A. adippe* (*A. aglaia* in error) figured Entom. xv. pl. i. figs. 2, 2a. On the upper surface the marginal and antemarginal spots are more elongated: on the under surface the confluent, silvery, basal spots of hind wings form distinct patches, and there are some silvery oblong spots on outer marginal area.

Fig. 2.—*Epinephele ianira*, ♂. Also captured at Eynsford, last year, by Mr. Newman. The upper surface is of the usual colour and otherwise normal, but on the under surface the discal area of the fore wings is whitish grey, inclining to buff towards base and inner margin; the margins and outer border of these wings are greyer than usual. The hind wings are also greyer than in typical specimens.

Fig. 3.—*Lycæna corydon*. So far as regards the body and three of the wings this appears to be a male specimen, the left fore wing and half of the thorax, however, are of the female colour, with some patches of blue scales on the wing. On the under surface the specimen seems to be normal, except that there is a broad dark-grey dash along the costal area of the left fore wing. This specimen was taken at Purley, by Mr. Kirkman, of Plumstead.

When sending the specimens just referred to, Mr. Sabine also included some other varieties that he had obtained during last season. Among these were the following:—A fine example of *syngrapha*, the blue female form of *L. corydon*, taken by Mr. Stockwell, at Dover. An example of *Euchloë cardamines* with curious pale orange tips (Plumstead). Two specimens of *Chrysophanus phloxas*, taken by his son, at Dartford, in October; one of these had unusually large blue spots on the hind wings, and the other had the black before the band on the hind wing delicately streaked with the coppery colour.

RICHARD SOUTH.

NOTES ON LEPIDOPTERA IN SUFFOLK IN 1901.

By CLAUDE A. PYETT, M.I.J.

It was with pleasure that I was able this year to renew acquaintance with my favourite branch of entomology after two years' comparative inactivity, owing to pressure of professional engagements, and this *résumé* of my more notable captures in Suffolk will, I think, show that the season has been exceptionally productive from the lepidopterist's point of view.

Briefly summarised, the year has been remarkable in one curious respect, that many of the usually common species have been conspicuous by their infrequent occurrence, whilst rarities have turned up in unexpected places. In speaking of the productiveness of the season, however, I should exclude the first five months of the year, during which moths were decidedly scarce, collecting at light, with which I am principally familiar, being an absolute failure. This circumstance I attribute to climatic influences, the weather being "magnificently feminine," as a London editor facetiously described it. A few warm sunny days were sandwiched in a long period of wet, wintry, and windy weather, and I witnessed the unusual spectacle of four species of

hybernated butterflies disporting themselves in the centre of Ipswich one spring-like morning in April. These included two *Gonepteryx rhamni* and *Vanessa io* (which seems to be getting scarcer year by year), whilst I also saw one *Colias edusa* at Barham later on—the only specimen of this irregular visitor which I encountered this year.

Looking at my diary I find the first noteworthy capture was *Tephrosia punctulata*, several of which were boxed on tree-trunks in Woolpit Wood on June 8th, together with one *T. extersaria*. The last-named was also netted at Bentley Wood on the 29th, when several other local Geometræ were beaten, viz. *Macaria notata* (a long series), *Bapta temerata*, *Ephyra punctaria*, *Acidalia trigeminata* (a rubbed specimen), *A. candidata* and *A. luteata*. Plenty of Micros were disturbed, including two which had not previously been recorded in the county, viz. *Stigmonota redimitana* = *nitidana* and *Penthina picana* = *corticana*. A number of *Crambus inquinatellus* were taken, also *Halias prasinana* (female), *Harpella geoffrella*, *Halonota cirsiana*, *Dicrorampha politana*, *Phoxopteryx lactana*, *Coleophora limosipennella* (two), and *C. anatipennella*. I was also rather surprised to take *Homæosoma sinuella* so far inland.

Anent my capture of *Acidalia trigeminata*, I gather from correspondence with Mr. C. G. Barrett, that this pretty species (which beginners using "Newman's" are apt to confuse with *A. bisetata*, owing to the transposition of the figures) is becoming very scarce in this country. It may therefore be interesting to record the wide distribution of the moth in the Ipswich district. I have met with it several times during an experience of eight years, in fact I have not set all I have taken. It has more than once come to light, but usually I have found it on palings, and in this situation I secured it this summer—three in the borough, one at Westerfield, and another at Barham, in addition to the Bentley specimen. I find on looking back through my diary that my first record for the species was in the summer of 1895.

Reverting to my captures for June, the finding of *Cossus ligniperla* and *Orgyia pudibunda* on palings in the town may be mentioned. I also saw lying in the road whilst cycling through Little Glemham a damaged specimen of *Arctia villica*, a moth which is by no means so common hereabouts as one might expect. July was ushered in with *Dipterygia pinastri* (*scabriuscula*), two of which were detected under a wall ledge; whilst on the 2nd an interesting addition was made to the Suffolk list of Micros in the shape of *Tinea merdella*, which was flying in numbers in the Lecture Hall, Ipswich, their presence being presumably accounted for by the baize covering of the platform. I could have secured some fifty specimens, but being engaged reporting a meeting, I only managed to box two which alighted

close by. A day or two later I boxed *Tinea nigripunctella* on the entrance door of the hospital. This species was also new to the county. Light yielded some notable captures, including the rare *Apamea ophiogramma*. I may mention that Mr. Hy. Miller, of Ipswich, tells me that he and Mr. Hy. Lingwood, of Needham Market, have also taken this species this year. It should be explained that all my collecting at light has been at suburban street lamps fitted with incandescent mantles, and a nocturnal excursion has never failed to result in a good capture. The best records for the month included *Smerinthus ocellatus*, *S. populi*, pale forms of *Bombyx neustria*, *Nudaria senex*, *Liparis salicis*, *Amphidasys betularia* var. *double-dayaria* (which is not infrequently met with in Ipswich), *Leucania conigera*, *L. lithargyria*, *Hecatera serena* (several), *Aplecta advena*, *Thyatira derasa*, *Tethea subtusa*, *Acidalia rubricata*, *Iodis vernaria*, *Phibalapteryx vitalbata*, *Cidaria fulvata*, *Eupithecia fraxinata*, *E. subnotata*, *E. oblongata*, *E. succenturiata*, *E. sobrinata*, *E. pumilata*, *Strenia clathrata*, *Emmelesia alchemillata*, *E. decolorata*, *Timandra imitaria*, &c.

The Micros were also well represented, the commonest being the pretty *Pyrallis costalis*. This was constantly met with from the beginning of July right up to October, and it was nothing unusual to see three or four on a lamp. It would have been a perfect pest but for the peculiar habit it has of resting with its wings pressed flat on the glass, by which, viewed from below, it is readily distinguished. *Endotricha flammealis* was also a frequent visitor to light in the town, and single specimens were also taken of *Euzophora pinguis*, *Halonota fœnella*, *Ephestia elutella*, *Myelois cribrum*, *Carpocapsa pomonella*, *Homocidus nebulella*, *Rhodophaea formosa*, *R. consociella*, *Sphaleroptera ictericana* (female), and *Hydrocampa stagnalis*.

The specimen of *R. consociella* requires more than passing notice, it being a very fine variety—dark purple instead of bright purplish red. Mr. C. G. Barrett thinks it may be a local form, as it quite differs in colour from any that he has hitherto seen; but I cannot settle the point, as I have never met with the species before. I searched the few oaks in the neighbourhood in hopes of finding some of the larvæ, but was not successful. Another interesting and unique capture was an exceptionally fine and large pale variety of *Acidalia incanaria* (*virgularia*) which I took near Bentley. This has also been examined by Mr. Barrett, who considers it the most beautiful and by far the most distinctly marked specimen of this rather obscure species which he has ever seen. He informs me that this pale form is known abroad, but he does not recollect it occurring elsewhere in this country. I think it must be a local form, as I have another older specimen, quite as large, and taken several years ago in Ipswich, whilst two or three others were met with in the same

spot at Bentley; but as I was not at the time aware that they differed from the type, I unfortunately did not trouble to set them out. I intend, however, to try and get other similar examples next year.

Bentley Wood was a veritable happy hunting-ground during July. I made two or three visits there with Mr. A. E. Gibbs, of St. Albans, and we tried sugar with good results, the best Noctuæ being *Orthosia suspecta*, *Thyatira batis*, *T. derasa*, *Noctua baia* (in profusion), *Cerigo cytherea*, *Amphipyra pyramidea*, *Dipterygia pinastri*, *Xylophasia scolopacina*, &c. Numerous specimens of *Herminia tarsipennalis* and *Endotricha flammealis* were also boxed, whilst *Triphæna pronuba* was present in abundance. A day with the beating-stick on the 23rd was productive of fairly good results. Being dull, butterflies were only occasionally seen, and the only noteworthy captures were *Limenitis sibylla* and *Thecla quercus*. The former were getting over, and I congratulated myself on having made a special visit a fortnight earlier, when I netted eight grand specimens. Scores could have been easily taken, I am glad to say, notwithstanding the regrettable fact that something like a thousand specimens were caught last year by two or three unprincipled collectors. *Calligenia miniata* was taken at dusk with *Crambus pinetellus*; *Coremia quadrifasciaria* was found on palings, and Mr. Gibbs also espied *Geometra papilionaria* on a leaf. *Xylophasia lithoxylea* was detected on a fir-trunk, resting with head downwards, a peculiarity which I have more than once noticed in regard to this species. The Micros encountered included *Harpipteryx xylostella*, several *Rhodophaea tumidella* in fine condition, *Pædisca solandriana* (rather worn), *Ebulea verbascalis*, &c. We stayed the night in the wood, putting up at a cottage. Next morning we resumed operations, but beyond *Lycæna argiolus*, *Argynnis adippe*, and *Epione apiciaria*, nothing worth recording was met with. Several eggs of *Cerura vinula* were seen on the upper surface of leaves of aspen bushes, looking to all appearances like galls. On the way home to Ipswich I boxed another *C. pinetellus*.

The latter end of August I spent at Felixstowe with Mr. Gibbs, and some scarce coast things came to sugar, including long series of *Agrôtis ripæ* and *A. vestigialis*; also innumerable specimens of *A. tritici* and *A. nigricans*, many of which were very interesting varieties. On Landguard Common *Crambus contaminellus* and *Cledeobia angustalis* were found in considerable numbers in the daytime, whilst *Gelechia desertella* was swarming in the grass-tufts. Several *Homœosoma sinuella* were also netted, and two *Herbula cespitalis*. A morning with the beating-sticks on the cliffs towards Bawdsey was not very profitable, but what few things we met were good. I took a fine specimen of *Platyptilia gonodactyla* and two *Conchylis dilucidana*, the latter being a new record for the county; whilst Mr. Gibbs was fortunate in cap-

turing *Spilodes palealis*. Inspection of palings resulted in the addition of *Eupithecia coronata*, *C. pinctellus*, *Antithesia salicella*, *Spilonota ocellana*, *Sciaphila alternella* (*chrysanthæana*), *Depressaria costosa*, *D. liturella*, *Ecogenia quadripuncta* = *kindermanniella*, and *Xanthosetia hamana*; whilst *Tinea tapetzella* and *T. biselliella* were noticed at my lodgings. I had previously never met with *biselliella* outside Ipswich. It was imported into my house in a mattress in 1895, and caused havoc amongst the upholstered furniture. In the summer of 1896 I practically exterminated the pest by searching for the imagines at night, killing some two hundred altogether early in June before they had time to breed again. The gaudy *Zygæna filipendulæ* were swarming on the downs in the Landguard Fort enclosure, but I had never met with the species previously in Suffolk. Like *Euchelia jacobææ*, it seems to be very local.

Returning to Ipswich on August 2nd, I was fortunate in getting *Epunda viminalis* in good condition at light, which also yielded *Notodonta dictæa*, *Ptilodontis palpina*, *Ephyra omicronaria*, *Pelurga comitata*, *Thera firmata*, *T. variata*, *Eupithecia centaureata*, *Crocallis elinguaris*, *Hyponomeuta padellus*, *Crambus tristellus* and *C. geniculeus* (both perfect pests), *Paraponyx stratiotæ*, *Ebulea verbascalis*, *Eudorea cembræ*, *Pionea forficæ* (abundant), *Cataclysta lemnata* (female), *Eupcecilia atricapitana*, *Phycis roboræ* (rubbed), *Plutella cruciferarum*, *Depressaria subpropinquella*, *Gelechia mulinella*, *G. senectella* (?), and last but not least *Leioptilis osteodactylus*, an unexpected visitant at a street lamp, and a notable addition to the county list. Search of walls produced a nice brown female form of *Hepialus sylvinus*, whilst *Catocala nupta* was frequently met with; *Phyllocnistis suffusella* was found swarming on palings near poplars before dusk; and varieties of *Plutella cruciferarum* were beaten on Rushmere Heath. Dusking at Yoxford, the garden of Suffolk, in the beginning of the month resulted in *Ephyra punctaria*, *Platyptilia ochrodactylus* = *bertrami* (which also came to an Ipswich street-lamp), *Pterophorus monodactylus* = *pterodactylus*, *Mimæseoptilus fuscus*, *C. pinctellus*, *Spilodes cinctalis*, &c. I also secured several full-fed larvæ of *Sphinx ligustri*, which were found on an ash tree under curious circumstances, my attention being called to the frass by a lady who imagined they were smuts or gunpowder pellets from some mischievous boys in an adjoining garden! I mention this as a striking instance of rural ignorance.

September was principally noted for the occurrence of *Sphinx convolvuli*, which came regularly to the flowers of *Nicotiana glauca* in my garden just before dusk. This fine moth seems to have been abundant this year, dozens of specimens having been reported from Belstead, Stutton, and several parts of Ipswich. Light was not quite so productive, but I took a nice *Luperina cespitis*, four *Heliophobus popularis*, *Eugonia tiliaria* = *alniaria*,

Acidalia promutata, *Thera variata* (var.), and a diminutive *Acidalia aversata*.

I spent the afternoon of Sept. 7th at Bentley Wood, and curious to say, the only Macro I took was *Macaria notata*, evidently a second brood. Micros, however, were beaten in numbers. I boxed about fifty altogether, including *Cerostoma radiatella* (a variable series), *C. costella*, *C. sylvella*, *C. vittella* (?), *Chelaria hübnerella*, *Penthina betulætana*, *Dictyopteryx contaminana*, and *Ephippiphora bimaculana* (*Halonota similana*); *Grapholitha penkleriana* was also found in great numbers; also several *Peronea ferrugana* and *Pædisca solandriana*, one or two of the latter being variable forms.

Up to the time of writing, October has yielded *Diloba cæruleocephala*, *Polia flavicincta* (several), *Eubolia cervinaria* (four), *Cidaria miata*, and *Orthosia macilenta*.

I must not close this review of the season without expressing my indebtedness to Mr. Barrett and the Rev. E. N. Bloomfield for kind assistance in determining my Micros.

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VARIATION IN THE GENUS EREBIA.

BY GEOFFREY SMITH.

PART I.

(Continued from Entom. xxxiv. p. 308.)

It is now time to look back at Table II. in the light of the foregoing remarks. This table, which actually represents case (1) is typical also of case (4). In both these cases the sex that is in the minority is also constant. A discussion of this constant factor is necessary. In Table II. the constant female heritage of $4\frac{1}{2}$ was added to the variable male heritages, and in this way the powers for the next generation were raised, with a corresponding rise in the mean power. But if males and females are in equal numbers in the next generation, then the powers in column 6, Table II., must be equally distributed between males and females. But the females have a constant power, viz. 9, hence the calculated mean power for the males will be $4\frac{1}{2}$, which is the same as in the preceding generation; hence no rise of power has taken place. In other words, the deductions that were made from this table can only hold good if the females of the next generation are ignored. I believe that there is good reason for ignoring them. For what is the meaning of this constant state of the females and variable state of the males? It means, firstly, that the variable state of the males has no

effect on the constitution of their female offspring, for if so, a mean would be established for the females intermediate between 9 and the various powers of the males. But this does not occur. Hence we must suppose that the constant power of the females is handed down independently of the males. But if this is so, what reason is there for supposing that the constant power of the females has any effect on the variable powers of the male offspring? The reason, I think, is given in the two terms constant and variable. The constant power represents the power that is typical of the species; all reversionary processes tend towards its re-establishment. It is consequently prepotent over the variable powers, and in the females asserts itself entirely, although the tendency of each female, being partly the product of a variable male, should be to vary partly in accordance with its male parent. In the males this variability is not entirely effaced by the constant heritage from the female parent, but it is largely affected by it, owing to the strength that naturally belongs to a constant and typical factor. In other words, the variable male heritage is not strong enough to influence the female offspring, but the constant female heritage is strong enough to influence the males.

In cases (5) and (6) there is supposed to be no constant or prepotent factor, so the mean (M) between the two sexes would tend to establish itself if the numbers of the sexes were equal; if one sex or the other preponderates, a state of fluctuation would be maintained. It will be well to follow this out a little more closely.

In cases (1) and (4) one of the sexes was supposed to be constant with regard to the character under consideration: it was shown for case (1), and so incidentally for case (4), that a state of equilibrium or comparative constancy would be attained for the variable sex if every individual paired, by means of a steady march in the direction of the constant sex. It has also been shown that if the sexes are quite unequal in number, this steady march is very unlikely to occur.

Now, in cases (5) and (6) there is no constant sex, *ex hypothesi*, to which the other is to conform. How then would a state of equilibrium be attained, supposing the sexes were equal in numbers. Let us take an instance.

The M of certain males of *E. cassiope* inhabiting a given area is 4; that of the females inhabiting the same area is 5. If all breed we may be certain, ignoring of course other factors and exigencies, that the M of the next generation will be $4\frac{1}{2}$. Supposing that the range of variation is between 1 and 9, we know that with the M at $4\frac{1}{2}$ any of the values between 1 and 9 may occur. But if the M keeps at $4\frac{1}{2}$, as it will do if proportional numbers of each variety breed every generation, the number $4\frac{1}{2}$, being the most probable value of any unknown measure in the group—i.e. representing the mediocre condition—will tend to

establish itself as the typical number. (A further discussion of this will be given.)

It is plain also that if the M of $4\frac{1}{2}$ is not preserved from generation to generation owing to the inequality of the sexes, then that M has no very much better chance of establishing itself than any other. Hence a state of fluctuation.

The cases typified by (5) and (6) are, I believe, of more general application than (1) and (4); and also they demand less theoretical hypothesis for their explanation. But I found the latter more convenient to deal with at first owing to the simplicity of the figures when given in full.

I think it will be found, when dealing with actual data in reference to some particular character or characters, that the species under consideration cannot be very definitely referred to any of the six categories given above, but possesses some of the qualities of several in a not very marked degree. Also many instances will occur to the reader's mind of animals with sexes disproportionate in numbers, and yet with no marked degree of variability, &c.; but it must be remembered that only one factor in a very complex mechanism, that of heredity, is being taken into account. When the rule is stated—that equality in the number of the sexes tends towards equilibrium, *i.e.* fixation of one character or degree of a character, and that inequality when coupled with variability in the preponderating sex tends towards continued fluctuation—it must be borne in mind that this rule would be *strictly* true, only on the condition of all other factors being equal; but in nature, where interaction is universal, its particular effect may be entirely obliterated or at least modified. Nevertheless, if it is shown to hold good in theory, its possible effect must not be ignored in practice.

In the foregoing Part, a factor has, as it were, been isolated from all the other factors with which it is naturally compounded, and has, so to speak, been examined *in vacuo*. We will, in the next Part, turn to actual data, and consider them in the light of the theoretical considerations already discussed.

To recapitulate so far: equality in the numerical proportions of the sexes tends towards constancy of characters. If one sex is already constant, the variability of the other will tend to conform to the constancy of the one, owing to the prepotency of reversion. If both sexes are variable and there are no marked reversionary tendencies, then a mean will be struck between the two variabilities, which will become constant, according to the laws of chance. If, however, the sexes are very unequal in numerical proportions, and the preponderating sex is variable, whether one sex is constant or not, the variability of one or both sexes is preserved, owing to the impossibility of the laws of chance working regularly.

(To be continued.)

A LIST OF THE LEPIDOPTERA OF COUNTY CORK.

By C. DONOVAN, M.D., F.E.S., Capt. I.M.S., and R. J. F. DONOVAN.

(Concluded from Entom. xxxiv. p. 336.)

A. corticea, scarce, T.; three specimens, C. *A. nigricans*, one, the var. *fumosa*, C. *A. tritici*, common, G. and C. *A. obelisca*, about six specimens picked out by Mr. Barrett in a long series of *A. tritici* procured at C. *A. strigula*, not very common, T.; fairly common, G. *A. lucerneæ*, two near C.; a few, G. *Noctua glareosa*, scarce, T. [*N. augur*: although Mr. Kane says this moth is to be met with throughout Ireland, we have never met with it.] *N. plecta*, common. *N. c-nigrum*, not scarce, T.; common at G., and especially so at C., in the autumn brood, about September. *N. triangulum*, rather scarce, T.; few, G.; several, C. *N. brunnea*, fairly common. *N. festiva*, one, T.; few, G., and near Bandon; several, C. *N. dahlîi*, two specimens at G. *N. rubi*, fairly common. *N. umbrosa*, a few specimens. *N. baia*, one, T.; few, C.; common near Dunmanway and G. *N. xanthographa*, very common. *Triphæna ianthina*, fairly common. *T. fimbria*, scarce. *T. interjecta*, four specimens, T.; common, G. and C. *T. comes*, common. *T. pronuba*, very common. *Amphipyra pyramidea*, a number of specimens in 1901, T.; common, C.; as many as a dozen on a sugared tree. *A. trago-pogonis*, common. *Mania typica*, one, T.; few, G.; and near Bandon. *M. maura*, one larva, T.; few, G. *Panolis piniperda*, three specimens, T. *Pachnobia rubricosa*, scarce, T.; few, near Bandon. *Tæniocampa gothica*, common, T., and near Bandon. *T. incerta*, rather scarce, T., and near Bandon. *T. stabilis*, common, T., and near Bandon. *T. gracilis*, scarce, T., few near Bandon. *T. pulverulenta*, common, T. *Orthosia lota*, not common, T.; common at G., and near Bandon. *O. macilenta*, not so frequently met with as the preceding species, T.; common, G. *Anchocelis pistacina*, fairly common, T. *A. lunosa*, not common, T.; several, G. and C. *Cerastis vaccinii*, common, T. and G. *Scopelosoma satellitia*, common, T., G., and near Bandon. *Xanthia flavago*, rather scarce, T.; few near Bandon. *X. circellaris*, common. *Cirrhædia xerampelina*, two specimens, G. *Calymnia trapezina*, rather plentiful, T.; several, C. *Dianthæcia luteago* var. *barrettii*, two specimens near C.; the first a couple of years ago, identified by Mr. Kane; the second procured this year, concerning whose identity there was considerable doubt, has now been definitely pronounced by Mr. Barrett to be this species. *D. cæsia*, few, C.; several, G. [*D. nana*.—Mr. Kane in his Catalogue, has attributed to me (C. D.) the captures of this species at G. I do not recollect the moth, nor does my register contain any record of the occurrence.] *D. capsicola* and *cucubali*, common. *D. capsophila*, common on the coast, as well as some

four miles inland. *Hecatera serena*, rather scarce, T.; several, G.; common, C. [*Polia chi*.—Although said to be widely distributed and frequently common, it has never been procured by us.] *Miselia oxyacanthæ*, fairly common. *Agriopsis aprilina*, one, T.; several, G.; and near Bandon. *Euplexia lucipara*, common. *Phlogophora meticulosa*, very common; we have counted as many as thirty-four on one tree, and twenty-one on another, at sugar at C., on a night in September of this year. *Aplecta prasina*, scarce, T.; several, G. and C. *A. nebulosa*, common; all of the pale whitish grey coloration. *Hadena dentina*, common. *H. dissimilis*, scarce, T. *H. oleracea*, common. *H. thalassina*, not common, T.; common, G.; several, C. *Xylocampa areola*, common, T., and near Bandon. *Calocampa vetusta*, common, T. and G. *C. exoleta*, scarce, T.; several, G. *Xylinia ornithopus*, scarce, T.; several, G. *X. socia*, common, T. and G.; one, C. *Cucullia verbasci*, three imagines captured and the larvæ plentiful this year at T., on *Scrophularia aquatica*, and some on *Verbascum thapsus*; two larvæ on *Scrophularia nodosa*, at Castlefreke, near Rosscarberry. Prior to the present year the conspicuous larvæ were never noticed; there must have been a recent immigration of the moth. (Mr. Kane is doubtful whether our moth is *verbasci* or *scrophulariæ*). *C. absinthii*, two imagines, T.; larvæ very plentiful this year, both on *Artemisia absinthium* and *vulgaris*, in about twenty localities within a six miles radius of C. *C. umbratica*, common. *Gonoptera libatrix*, fairly common. *Habrostola tripartita*, scarce, T.; several, C. and G. *H. triplasia*, common. *Plusia chrysitis*, common. *P. bractea*, one, T.; several, G. and two localities near Bandon. *P. festuæ*, common, T. and C.; one near Bandon. *P. pulchrina*, scarce, T. and G. *P. gamma*, very common. *Anarta myrtilli*, larvæ not uncommon, T.; several imagines, G. *Heliothis peltigera*, one, G. *Chariclea umbra*, not scarce, T.; few, C. *Erastria fasciana*, two specimens near G. *Phytometra viridaria*, common, T. and G. *Euclidia mi*, not common, T. and G. *Rivula sericealis*, common, T.; several, C. *Zanclognatha grisealis*, common. *Z. tarsipennalis*, scarce, T.; one, C. *Bomolocha fontis*, scarce, T.: one, G.; two, C. *Hypena proboscidalis*, common.

GEOMETRÆ.—*Uropteryx sambucaria*, common. *Epione apiciaria*, scarce, T.; few, G. *Rumia luteolata*, very common. *Venilia macularia*, common, T.; near Bandon. *Metrocampa margaritaria*, common. *Ellopiopsis prosapiaria*, rather scarce, T.; several, G.; few, Dunmanway. *Eurymene dolobraria*, several, T.; three, C.; few, Dunmanway. *Selenia bilunaria*, common, in both broods. *Odontopera bidentata*, common. *Eugonia alniaria*, one, T. *E. quercinaria*, common, T. and G.; one, C. *Himera pennaria*, fairly numerous, T.; several, near Bandon. *Phigalia pedaria*, scarce, mostly met with in pupal state, T.; one, G. *Amphidasys strataria*, a few males at light, and a single

female at rest, from whom ova were obtained, *T. A. betularia*, larvæ and pupæ, plentiful, T.; few, *G. Cleora lichenaria*, fairly common. *Boarmia repandata*, common. *B. cinctaria*, one specimen, T. *Tephrosia biundularia*, common, G. and C.; few, near Dunmanway. *Gnophos obscuraria*, not common. *Pseudoterpna pruinata*, common. *Geometra papilionaria*, two larvæ and one imago, T.; several, G.; common, near Dunmanway. *Iodis lactearia*, very common. *Hemithea strigata*, one, T.; single specimens, near Bandon, Drimoleague, and G.; several at C. *Zonosoma linearia*, one, T. *Acidalia dimidiata* and *bisetata*, common. *A. marginepunctata*, not common, T.; common, G. and C. *A. subsericeata*, not uncommon, T.: several, G.; common, C. *A. remutaria*, few, G. *A. imitaria*, common. *A. aver-sata*, common. *Cabera pusaria* and *exanthemata*, common. *Macaria liturata*, scarce, T. *Panagra petraria*, one, T.; two, G. [*Scodiona belgiaria*.—By mistake, Mr. Kane gives my name (C. D.) against this insect; the entry should be transferred to the next species.] *Selidosema ericetaria*, one, T.; several, G. *Ematurga atomaria*, common on heaths. *Bupalus piniaria*, one specimen, dusking on May 27th, 1900, T. *Sterrhia sacraria*, one specimen at ragwort on Aug. 27th, 1898, T.; seen by Mr. Kane. *Abraxas grossulariata*, very common. *Lomasipilis marginata*, common. *Hybernia marginaria*, not uncommon at willow blossom, T. *H. defoliaria*, a few imagines and pupæ, T. *Anisopteryx æscularia*, fairly common, T. *Cheimatobia brumata*, common, T., G., and near Bandon. *Oporabia dilutata*, common, T., G., and near Bandon. *Larentia didymata*, scarce, T., C.; common, G. *L. multistrigaria*, common, T. *L. viridaria*, common, especially inland. *Emmelesia alchemillata*, three specimens, T.; few, G. *F. albulata*, locally abundant, T. *E. unifasciata*, several, T. and C. *Eupithecia venosata*, common, a melanie variety at G. *E. pulchellata*, rather scarce, T.; common, G. *E. oblongata*, common, T. and C. *E. subfulvata*, scarce, T.; few, C. *E. plumbeolata*, scarce, T.; fairly plentiful in a small wood near Dunmanway. *E. scabiosata*, common, T.; few, C. *E. pygmaea*, one specimen beaten out of oak on June 24th, 1900, T. *E. satyrata*, a few specimens, T. and C. *E. castigata*, fairly common, T. and C. *E. jasioniata*, common by the sea, C. *E. virgaureata*, common, T. and C. *E. valerianata*, common, T. and C. *E. indigata*, one specimen, May 18th, 1900, T. *E. constrictata*, larvæ locally common, C. *E. nanata*, fairly common, T.; one, C. *E. vulgata*, common. *E. albipunctata*, larvæ plentiful on *Angelica sylvestris*, T. *E. absinthiata*, common, T. and C. *E. assimilata*, few larvæ and imagines, T. *E. tenuiata*, two larvæ in willow catkins, T. *E. lariciata*, rather scarce, T. *E. abbreviata*, common, T. and C. *E. togata*, larvæ plentiful in spruce fir-cones, T., and near Dunmanway. *E. pumilata*, common. *E. coronata*, scarce, T. and C. *E. rectangulata*, fairly common. *E. debiliata*, larvæ plentiful, T.

Lobophora viretata, very common, T. and C. *Thera variata*, common. *Hypsipetes trifasciata*, pupæ not scarce in rotten alder wood, T. *H. sordidata*, rather scarce, T.; common, G., Drimoleague and Dunmanway. *Melanthia bicolorata*, common, Drimoleague and Dunmanway. *M. ocellata*, common. *M. albicillata*, scarce. *Melanippe sociata* and *montanata*, common. *M. galiata*, fairly common, C. *M. fluctuata*, very common. *Anticlea badiata*, one specimen near Bandon. *Coremia unidentaria*, common; we have made no attempt to discriminate between this species and *ferrugata*. *Camptogramma bilineata*, very common. *C. fluviala*, a few specimens, T. *Phibalapteryx vittata*, not common. *Eucosmia undulata*, scarce, larvæ more plentiful than imagines, T.; few, G.; fairly common, Drimoleague and Dunmanway. *Cidaria siderata*, common. *C. miata*, scarce, T. and G. *C. corylata*, one specimen, T. *C. truncata* and *C. immanata*, common. *C. suffumata*, fairly common, T. and C. *C. prunata*, scarce, T. and C. *C. testata*, not common, T. and G. *C. populata*, fairly common, T. and G. *Pelurga comitata*, not common, T. and C. *Eubolia limitata*, very common. *E. plumbaria*, common. *Anaitis plagiata*, common.

PYRALIDES.—*Pyralis farinalis*, common, T.; few, C. *Scoparia ambigualis*, *S. basistrigalis*, *S. cembrae*, *S. dubitalis*, *S. mercuriella*, *S. cratægella*, *S. resinea*, *S. angustea*. *Nomophila noctuella*. *Pyrausta ostrinalis*. *Herbulus cespitalis*. *Ennychia octomaculata*. *Eurrhyncha urticata*, very common. *Scopula lutealis*, *S. prunalis*, *S. ferrugalis*. *Botys ruralis*, *B. fuscalis*, common. *Eubulea crocealis*. *Pionea forficalis*, common. *Orobena straminealis*.

PTEROPHORI.—*Platyptilia ochrodactyla*, *P. bertrami*, *P. gonodactyla* (?). *Amblyptilia acanthodactyla*. *Mimæseoptilus bipunctidactyla*, *M. pterodactylus*. *Edematophorus lithodactylus*. *Pterophorus monodactylus*. *Leioptilus tephrodactylus*. *Acipitilia pentadactyla*, very common. *Alucita hexadactyla*, common.

CRAMBI.—*Schœnobia forficellus*. *Crambus pratellus*, *C. perlus*, *C. tristellus*, *C. inquinatellus*, *C. geniculeus*. *Homœosoma binæcella*. *Ephestia kühniella*. *Phycis fusca*, *P. adornatella*. *Nephopteryx splendidella*, scarce in spruce fir-cones, T., and near Dunmanway. *Rhodophaea consociella*. *Aphomia sociella*, common. *Achræa grisella*.

TORTRICES.—*Dichelia grotiana*. *Tortrix podana*, *T. xylosteana*, *T. heparana*, *T. unifasciana*, *T. costana*, *T. viridana*, common. *T. forsterana*. *Leptogramma literana*. *Peronea sponšana*, *P. comparana*, *P. perplexana*, *P. variegana*, *P. hastiana*, *P. ferrugana*, *P. aspersana*. *Rhacodia caudana*. *Teras contaminana*. *Dictyopteryx læflingiana*. *Argyrotoxa conwayana*, common. *Ptycholoma lecheana*. *Penthina variegana*, *P. marginana*. *Hedya dealbana*. *Spilonota incarnata*. *Pardia tripunctana*. *Aspis udmanniana*. *Sericoris littoralis*, *S. lacunana*. *Orthotænia ericetana*. *Cnephasia musculana*. *Sciaphila conspersana*, *S. subjectana*, *S. virgaureana*, *S. colquhounana*, common on

rocks by the sea, C. ; the larvæ feed on *Armeria vulgaris*, in long silken tubes, entwined among the leaves and stems of the plant. There is marked variation, ranging from nearly white to a dark stone-grey. *Capua favillaceana*. *Bactra lanceolata*. *Phoropteryx lundana*. *Grapholitha nisella*, *G. nigromaculana*, *G. trimaculana*, *G. penkleriana*, *G. nævana*. *Phlæodes immundana*. *Pædisca corticana*, *P. profundana*, *P. semifuscana*. *Ephippiphora pflugiana*, *E. brunnichiana*, *E. trigeminana*. *Coccyx argyranus*, *C. tædella*. *Stigmonota regiana*. *Dicrorampha alpinana*, *D. herbosana*. *Catoptria ulicetana*, *C. hypericana*, *C. cana*, *C. citrana*. *Symæthis oxyacanthella*. *Eupæcilia pallidana*, *E. angustana*, *E. ciliella*. *Xanthosetia zoegana*, *X. hamana*. *Argyrolepis hartmanniana*. *Conchylis straminea*.

ON REARING *AGROTIS ASHWORTHII* AND *ACIDALIA CONTIGUARIA*.

By R. TAIT.

My annual visit to North Wales was made rather later than usual this year, and I did not reach Penmaenmawr until July 17th, by which time imagines of *A. ashworthii* were practically over. I did not find one, although a careful search was made; but Mr. W. G. Sheldon (who was staying at Penmaenmawr) was more fortunate, and captured two or three specimens at rest.

However, ova were fairly plentiful, and I decided to try and force them again. The results were fairly satisfactory, as I managed to get some sixty odd perfect insects, and should have had more, but for an illness which stopped the feeding of the larvæ just when many of them were almost full-grown. Two batches of ova failed to hatch at the same time as the others, although they changed colour; but eventually they produced a fine brood of minute ichneumonids.

A. contiguaria was taken sparingly by both Mr. Sheldon and myself, and I succeeded in obtaining a few ova. About sixty hatched, and by keeping them in the same temperature as the *A. ashworthii* I got about forty odd into pupæ by the end of August. They began to emerge on Sept. 8th, and between that date and the 23rd forty-four specimens came out, and were duly killed and set. Fully half of these were of the dark form, probably the progeny of a dark female; but as the ova were all put together, I cannot speak definitely on this point.

The moths pair easily, and I have now a nice batch of larvæ hibernating on heather.

I may add that I also forced a batch of *Noctua festiva* under the same conditions as *A. ashworthii*; these emerged during the last fortnight in October.

A NEW GENUS OF SOUTH AFRICAN COCCIDÆ.

By T. D. A. COCKERELL.

HALIMOCOCCUS, n. gen.

A Dactylopiine Coccid enclosed in a horny sac shaped like that of *Solenococcus*, without legs or antennæ in the adult. Larva with no rows of dorsal spines, no hairs on anal ring, and no caudal tubercles, but four long caudal bristles as in *Phænicococcus*. Closely related to *Phænicococcus* (which lives in Algeria), but distinguished by the form of the sac, which exactly imitates that of *Solenococcus*.

HALIMOCOCCUS LAMPAS, n. sp.

♀. Enclosed in a dark brown horny sac (which is not dissolved by liquor potassæ), which is shaped like a *Terebratula* shell, *i.e.* oval, with the end raised and terminating in an orifice. Length of sac 510μ , breadth 300, breadth of orifice about 66μ . The orifice is closed by a reticulated plate, except basally, where there is a semilunar opening. In immature examples the sac is prominently segmented on the ventral side.

♂. Scale small, cylindrical, horny, ferruginous, of the same texture as that of the female, but usually somewhat paler. Length 350μ , breadth 140. The end comes off, leaving a round opening, as in Muscid pupæ.

♀. A mere bag, with well-developed mouth and spiracles.

Larva.—Rather narrow; legs and antennæ present. No caudal tubercles, but two pairs of long caudal bristles; two small bristles close to these. Antennæ about 45μ long, six-jointed, last joint much the longest. No dorsal spines. Last antennal joint with two long bristles. Femur remarkably stout, about 15μ broad; length of femur + trochanter about 30μ .

Older specimens have actually shorter (36μ) antennæ, with joint 6 longer than $4+5$; 5 longer than 3, 3 longer than 4, 1 large.

A few white curled waxen threads protrude from beneath the sacs of the females.

Hab. In great numbers on upper sides of leaves of palm on the coast of Natal (Claude Fuller, No. 3). A remarkable insect, essentially a modification of the *Phænicococcus* type. With *H. lampas* in Natal, and *P. marlatti* in Algeria, it is not difficult to imagine the existence of a whole series of such forms in the vast intermediate region, the coccids of which are almost wholly unknown.

East Las Vegas, New Mexico, U.S.A.

Nov. 1st, 1901.

INSTRUMENT WITH WHICH MOTHS OF THE GENUS
ANTHERÆA CUT OUT OF THEIR HARD COCOONS.

BY F. P. DODD.

I AM not aware that any Australian entomologist has yet discovered how these silk-producing moths contrive to work their way out after bursting the pupa-shell. Many believed they managed it with their woolly prolegs, aided by the liquid they discharge to soften the material during the cutting process. A more reasonable supposition would have been that the powerful wing-veins near base performed the work, for a large percentage of the moths have the scales of fore wing for one-fourth or three-eighths of an inch from base completely rubbed off, giving the insects quite a shabby appearance, though perfect in every other way. Again, the insect whilst working seems to be employing the fore wings, apparently striking with one for a time, then the other.

However, Dr. A. J. Turner informed me that he was one day watching an *Antheræa simplex* cutting out, and observed that it did so with a pointed instrument, like the end of a small bradawl; but the insect having emerged, he did not see this again. As he was aware that I was breeding out several species, he expressed a wish that I should keep a watch when an opportunity arose. I was soon able to prove that there is a cutting "weapon," which our collectors appear to have failed to observe; but that is not strange, for, as the moth comes into view, his work is nearly completed, and there is little necessity for him to use the "cutter." This is a short hard black and curved thorn, situated in the thick joints at base of fore wings, one on each side; in a rubbed specimen the thorn is easily discernible, but in a good one it is concealed amongst the dense scales. This thorn is present in all my species; it can at once be felt in any specimen. It would be interesting to know whether anyone can state whence the liquid issues which the moth discharges to soften the cocoon where he cuts through; it must issue from near the thorn, for, as a rule, the scales left at base of the wing and alongside of the thorax are wet and matted when the moth emerges.

The cutting operation takes a considerable time—several hours; I have known *A. loranthi* to commence work at 2.30, and still be cutting at 7 o'clock, the constant "clicking" being heard several yards away. This species, besides having its cocoon to cut through, has the "community covering" to negotiate as well—an extra one-fourth or three-eighths of an inch of tough but loose material. When about to change the larvæ bunch together at the butt of the loranthus, and set to work together to spin a great outer web, which envelopes them. When this is completed each insect then constructs a cocoon, which is very thick and harder than those of *A. eucalypti*, *ianetta*, or *helenæ*.

One of these cocoon-masses* is forwarded, but some are larger; from a larger one I obtained seventeen moths. The cocoons are so placed that each moth can get out—at least, that is my experience.

ORNITHOPTERA CASSANDRA AND O. RICHMONDIA.

By F. P. DODD.

SOME entomologists are not quite satisfied that these fine butterflies are distinct, for they are so alike in their larval and perfect stages; the larvæ feed on *Aristolochia* of different species, and the males of both have the strange habit of frequently flying in pairs, it being quite a common sight to see a male of either closely followed by another. A writer in the 'Victorian Naturalist' mentions this peculiarity in *richmondia*, and I have noticed it myself in the Brisbane district.

With the larger and northern species *cassandra*, I am familiar in all its stages. From an article which I read in the 'Entomologist' several years ago, I can state that the eggs are identical in colour; the larvæ present a few slight differences, the principal being that *cassandra* is generally darker, and without a trace of the "invisible green" discernible in *richmondia*. The pupa of the latter is vivid green, as mentioned in the article referred to, and as seen by myself upon one occasion in the Brisbane Museum.

Cassandra chrysalis may be mentioned as being of a light brown underneath, and yellow above, between the wings and along to tip of abdomen. Pupæ in my boxes occasionally varied in a slight degree in the yellow colouring, and pupæ taken on green leaves in the bush were identical with mine. Therefore, I presume, such a wide and constant difference in the colour of the pupæ of the two butterflies is sufficient to prove that they are entirely distinct. A healthy pupa of *cassandra* is being forwarded to Dr. Turner, which may safely reach England. Most of the others of the brood produced imagines in May; this and several others still left were no doubt destined to outlast the long dry period we have between March and December or January. During some years' residence in Townsville, I have never seen the butterfly before December; so I hope that this particular chrysalis may be viewed by some of the entomologists of London. Should it emerge, an empty shell is also sent, which shows the colouring of a living chrysalis fairly well.

Warburton Street, Townsville, Queensland.

* This reminds us somewhat of a cluster of cocoons of *Aphomia sociella*, the silk of which it is composed is coarser.—ED.

DESCRIPTION OF TWO NEW GENERA AND THIRTEEN NEW SPECIES OF ICHNEUMONIDÆ FROM INDIA.

By P. CAMERON.

TORBDA, gen. nov.

Head cubital, largely developed behind the eyes, which are large and parallel; the malar space is large. Clypeus not distinctly separated from the face by a furrow; its apex transverse. Labrum largely projecting. Mandibles stout, their apex bidentate. Parapsidal furrows distinct at the base. Pronotum tuberculate in the middle. Mesosternum indistinctly furrowed laterally behind. Median segment large, rounded behind; there is one transverse keel at the base; the spiracles are linear, not elongated. Areolet large, longer than wide; the transverse cubital nervures slightly converging above; there is no stump of a nervure on the disco-cubital nervure; the transverse median nervure is received behind the transverse basal; the transverse median nervure in the hind wings is broken at the middle. Legs elongate, stout; the tarsi spinose; the fore tarsi are longer than the tibiæ; all the tarsi are thickly spinose. Petiole stout, narrowed at the base; the spiracles are placed almost in the middle; the penultimate segment is largely developed, is nearly as long as the four preceding segments united; the last segment is distinctly longer laterally than the penultimate; its apex is depressed and clearly separated; the cerci are long. The antennæ are long and stout; the second and third joints are equal in length; the fore tibiæ are distinctly narrowed at the base; the claws are simple; the occiput is broadly incised, and has a distinct but not sharp margin; the scutellum is large, rounded, and hardly raised above the level of the mesonotum; the hinder coxæ are large, about three times longer than thick; the scutellar keels are thick. The areolet is pentagonal, it being angled where the recurrent nervure is received. In *T. femorata*, and in the luteous section of the genus, the apex of the clypeus is obliquely depressed; in the male of that species the hinder tarsi are longer compared to the tibia.

I am not quite certain as to the exact location of this genus, or if it should form one or two genera. It has some affinity with the Cryptina. The position of the spiracles on the petiole separates it from the Cryptina. The very large hypopygium is somewhat as in the Acoenitini, but it cannot be referred to any of the described genera in that group. The depressed clypeus in some of the species is similar to what it is in the Xoridini, and they have some relationship to *Echthrus*. Probably the natural position of *Torbda* is with the Xorides. The species are very large and handsome—among the largest of the Ichneumonidæ.

A. Black, with white markings; the legs fulvous, marked with black and white.

1. Post-scutellum raised, depressed only laterally at the base. Wings suffused with fuscous or violaceous, not maculate. Large species.

a. Hinder femora and tibiæ fulvous.

Posterior knees and apex of tibiæ black ; the scutellum black, its apex white . . . *geniculata*, Cam.

Posterior knees and apex of tibiæ not marked with black ; the scutellum white, with a black line in the centre at the base . . . *violaceipennis*, Cam.

b. Posterior femora and tibiæ for the greater part black . . . *femorata*, Cam.

2. Post-scutellum widely hollowed ; the fore wings with a cloud at the base of the subdiscoidal nervure ; the areolet smaller, and receiving the recurrent nervure in the middle ; the cubital nervure at the base roundly curved, not straight, oblique and parallel with the basal . . . *maculipennis*, Cam.

B. Fulvous, marked with black ; the recurrent nervure is received at the base of the apical third of the cellule ; the lower part of the cubital nervure at the base straight, oblique and parallel with the basal ; the basal half of the petiole distinctly narrowed ; the top and lower side of the petiole sharply margined. Clypeal suture distinct.

Wings brassy ; the stigma rufo-testaceous ; the abdominal segments lined with black at the base only ; the apical segment with a small triangular depression in the middle, from which an obscure furrow runs obliquely down the sides . . . *fulgidipennis*, Cam.

Wings smoky, paler at the base ; the third and following segments of the abdomen deep black ; the last dorsal segment with an elongate depression down the middle . . . *apicalis*, Cam.

TORBDA FULGIDIPENNIS, sp. nov.

Ferruginea, thorace abdomineque nigro-maculatis ; alis fulvo-fumatis ; stigmatibus fulvis ; nervis nigris ; pedibus ferrugineis ; coxis posterioribus nigro-maculatis. ♀. Long. 23 mm. ; terebra, 13 mm.

Hab. Khasia (coll. Rothney).

TORBDA APICALIS, sp. nov.

Ferruginea ; maculis thoracis, apice antennarum late, apice abdominis terebraque nigris ; alis violaceo-hyalinis, stigmatibus nervisque nigris. ♀. Long. 18 mm. ; terebra, 11 mm.

Hab. Khasia (coll. Rothney).

TORBDA GENICULATA, sp. nov.

Nigra, capite, thorace abdomineque albomaculatis ; pedibus fulvis, trochanteribus, geniculis apiceque tibiæ posticarum late nigris ; coxis albis, nigro maculatis ; alis fulvo-hyalinis, nervis stigmatibusque nigris. . . Long. 23 mm. ; terebra, 13 mm.

Hab. Khasia (coll. Rothney).

TORBDA VIOLACEIPENNIS, sp. nov.

Nigra, facie, orbitis oculorum late thoraceque albomaculatis; pedibus fulvis; coxis nigris, albomaculatis; alis violaceo-fumatis; nervis stigmatæque nigris. ♀. Long. 25 mm.; terebra, 10 mm.

Hab. Khasia (coll. *Rothney*).

TORBDA FEMORATA, sp. nov.

Nigra, late albo-maculata; pedibus fulvis; coxis trochanteribusque albis; coxis, femoribus dimidioque apicali tibiæ posticarum nigris; tarsis posticis albis, basi nigro; alis fusco-hyalinis, nervis stigmatæque nigris. ♂. Long. 22 mm.

Hab. Khasia (coll. *Rothney*).

TORBDA MACULIPENNIS, sp. nov.

Nigra, capite, thorace abdomineque albo-maculatis; pedibus fulvis; coxis anticis albis, posterioribus nigris, basi albis; alis hyalinis, stigmatæ nervisque nigris. ♀. Long. 14 mm.; terebra, 6-7 mm.

Hab. Khasia (coll. *Rothney*).

COLGANTA, gen. nov.

Areolet large, wider above than below; the transverse basal nervure interstitial or nearly so; in the hind wings the transverse median nervure is broken below the middle; the radial cellule elongate, narrow. Antennæ stout, stouter at the apex than at the base; the basal joints of the flagellum greatly elongated. Eyes large, almost parallel, widely distant from the base of the mandibles. Clypeus not clearly separated by a suture from the face; the mandibles short, thick, bidentate at the apex. Labrum minute. Palpi long. Parapsidal furrows obsolete. Scutellum keeled laterally. Median segment with two curved keels at the base; its spiracles large, linear, oblique. Petiole longer than the second segment, distinctly dilated at the apex; the spiracles are placed near the base of the post-petiole, as in *Ichneumon*; there are eight segments; the ovipositor projects. Legs stout; the tarsi spinose; the claws large, curved, simple. In the only known male the antennæ are serrate, densely pilose, and taper perceptibly towards the apex. The head is obliquely narrowed behind, and has the occiput sharply keeled. The pterostigma is elongate, narrow.

The systematic position of this genus is not very clear. Only two views are tenable; it either forms a new tribe, or it forms a new subtribe of the Cryptina. It has a furrow on the lower part of the mesopleuræ, as in the Cryptina, and the female has the exerted ovipositor of that group, but it wants the parapsidal furrows; the transverse cubital nervures are oblique, and converge towards the bottom, while in the Cryptina they are either straight or converge towards the top. The form of the metanotal keels is different from what it is with the Cryptina; in that group they are straight, transverse, and do not form areæ. In the present group they are interrupted, and bent backwards, so that two complete areæ are formed.

COLGANTA NIGRO-MACULATA, sp. nov.

Lutea, antennis nigris, flagello late albo annulato; mesonoto, femoribus, tibiis tarsisque posticis nigris; alis fulvo-hyalinis; nervis stigmatæque nigris. ♀. Long. 15 mm.; terebra, fere 3 mm.

Hab. Sarawak, Borneo (*Shelford*).

Antennæ black, the sixth to nineteenth joints white. Head luteous; the vertex broadly in the middle and the greater part of the occiput black; the face is wrinkled in the centre; the sides bear large round clearly separated punctures; the mandibles are broadly black at the base. Thorax luteous, the sides paler in tint; the mesonotum and the sides of the median segment at the base black; the mesonotum is closely punctured; the scutellum is thickly covered with long black hair; the scutellum is keeled to near the apex. The median segment is wrinkled; the basal keels are straight at the base; the rest of them are irregularly twisted and curved towards the edges of the segments, where they join a straight lateral outer keel, a large enclosed area being thus formed, which is about twice longer than broad. Propleuræ punctured above, the middle obliquely striated. Mesopleuræ smooth and shining; the metapleuræ with the lower apical part stoutly obliquely striated. The four front legs are coloured like the body, with the middle femora darker above; the hind legs black; the coxæ and the basal joint of the trochanters luteous; the coxæ are marked with black at the apex above. The apex of the petiole and the other abdominal segments are for the greater part fuscous-black above.

COLGANTA RUFIPES, sp. nov.

Nigra; pedibus rufis; tibiis posticis nigris; alis fulvo-hyalinis. ♀. Long. 15 mm.; terebra, 4 mm.

Hab. Borneo.

Antennæ black, the eighth to seventeenth joints white beneath; the apical joints brownish. The face roundly projects in the middle, and is there closely but not strongly punctured; the sides bear large deep punctures, and are irregularly striated on the inner side; the malar space is brownish; on the lower inner orbits is a pale yellowish mark. Mesonotum and scutellum closely punctured; the apex of the scutellum and the post-scutellum pale testaceous. The base of the median segment is closely punctured and irregularly striated; the middle of the apical slope of the segment is closely, irregularly striated; the sides are coarsely, irregularly reticulated; the lower outer part bears four stout keels, and is bordered by keels on either side. The lower half of the propleuræ is stoutly keeled; the mesopleuræ almost smooth; the metapleuræ closely, obliquely striated on the apical half. Legs rufous; the apex of the hinder femora, the tibiæ, and the base of the hinder tarsi black; the rest of the hinder tarsi white. Abdomen black; the apical two segments white above.

This genus is probably well represented in Northern India. The species known to me from the Khasia Hills may readily be recognized by the following table. They are all fulvous or ferruginous in colour.

- 1 (8) Areolet distinctly narrowed on the lower side; the nervures oblique.
- 2 (5) The tarsi not black, at most only slightly annulated with black.
- 3 (4) Wings hyaline, suffused yellow or fulvous; the antennæ pale yellow, the apex broadly black. Length, 12 mm.; terebra, 4 mm. *fulripennis*, Cam.
- 4 (3) Wings dark violaceous; the antennæ blackish, annulated with dark fulvous. Length, 16 mm. ♂ *fulgidipennis*, Cam.
- 5 (2) The tarsi black.
- 6 (7) The tibiæ black. Length, 12 mm. ♂ *tibialis*, Cam.
- 7 (6) The tibiæ not black. Length, 12 mm. ♂ *tarsalis*, Cam.
- 8 (1) Areolet not distinctly narrowed on the lower side; the nervures straight. Length, 12 mm.; terebra, 2 mm. *tuberculata*, Cam.

DESCRIPTION OF A NEW GRASSHOPPER FROM NATAL (*POMATONOTA BIPUNCTATA*, KIRBY.)

By W. F. KIRBY, F.L.S.

AMONG some Orthoptera recently received by Mr. Distant from Natal, collected by Mr. A. Ross, I found a pair which appear to belong to a new species allied to *Pomatonota dregii*, Burm. This is a small green species, with very long legs, belonging to the family Mecopodidæ, and the subfamily Moristinæ. The wings are short and broad in the fully developed insect; but in the only specimen of *P. dregii* at present in the Natural History Museum they are only just visible under the shield. The types of *P. bipunctata* are also apterous or subapterous. Whether the specimens before me are immature, or whether they are micropterous specimens of a dimorphous species, we must wait for more specimens to decide. A description is given below.

POMATONOTA BIPUNCTATA, sp. n.

♂. Long. corp. 20 mm.; capit. et pron. 13 mm.; fem. post. 20 mm. ♀. Long. corp. 17 mm.; capit. et pron. 10 mm.; fem. post. 14 mm.; ovip. 15 mm.

Size and general shape of *P. dregii*, Burm. Brown, with a slight reddish or coppery lustre, especially on the face; mandibles smooth, shining, pale orange; hinder edge of the pronotum marked with two large black spots, and a few smaller ones beyond and on the disc; abdomen with some longitudinal rows of black dots, and with a purplish and black oblong mark at the base on each side; wings in male blackish, half hidden by the shield, somewhat as in the European genus *Ephippiger*, which this species also resembles in the long slender upcurved ovipositor.

The colour, and especially the two conspicuous black spots at the extremity of the pronotum, besides the form of the ovipositor, will sufficiently distinguish the present species from *P. dregii*. From *Ephippiger*, which belongs to another family, the structural characters, such as the open foramina and the two spines on the prosternum, will distinguish it at a glance.

One pair of this rather remarkable insect, which will be figured in a forthcoming part of Mr. Distant's '*Insecta Transvaaliensia*.'

NOTES AND OBSERVATIONS.

ABERRATION OF *VANESSA URTICÆ*. — The Reverend Archibald Day has been good enough to send for inspection a well-executed coloured drawing of a variety of *V. urticæ* that he captured at Storridge, near Malvern, in Worcestershire, on September 26th, 1901. It is a modification of the aberration of this species figured in the '*Entomologist*,' vol. xxxiii. pl. iii. fig. 1, but differs from that specimen in having the outer margin of all the wings normally angulated; the outer marginal area of the fore wings is more variegated, and there are some rather large blue submarginal spots on the hind wings. There is a blue spot between second and third median nervules of fore wing, placed farther from the margin than the normal blue spots in typical *V. urticæ*.

AUTUMNAL PUPATION OF *CERIGO CYTHEREA*. — I have a number of larvæ of *C. cytherea* which I am endeavouring to get through the winter; they are all about an inch in length, excepting two, which fed up rapidly to a large size and have subsequently pupated. It would be interesting to know if it is the rule for this species to pupate in the late autumn, as I believe they are commonly known as hybernators. — A. J. LAWRENCE; Bromley Common, Kent.

THIRD BROOD OF *PHRAGMATOBIA FULIGINOSA*. — On May 5th last I had a female *P. fuliginosa* sent me by a friend, and on the 8th she laid between thirty and forty whitish eggs. These began to hatch on May 23rd, a dark speck having appeared two days before in each egg, which gradually spread over the whole, making it appear of a dark grey colour. All of them hatched out by next day. The caterpillars were then of a dark greyish colour, most difficult to distinguish from their food-plant. They fed well on dock, eating the lower membrane, and lying on the under side of the leaf along the veins. From some cause, possibly being too dry at their first moult, their number was on the 29th reduced to six; they were then covered with light reddish hairs, but this tint on June 1st became much darker, so that there was no further difficulty in seeing them. They grew fast, and five ultimately spun up about the end of June; unfortunately I omitted to make a note of the exact days. They were, however, about eighteen days in the pupa state, and the first moths emerged on July 18th. They proved to be a pair, and again I had a batch of between forty and fifty fertile eggs. The larvæ began to emerge on July 29th, and

all came out on that and the following day. I have so far been successful in rearing most of these. They varied considerably in size from the first, and by the end of September ranged from one-half to one inch in length, some of them apparently being at least a moult behind others. The colour of the hair of those similarly advanced also varied from light reddish to dark brown, the latter being by far the commoner; and it will be interesting to note whether the imagoes will differ in the same way. Two spun up on Sept. 25th and 26th, but the remaining caterpillars, thirty-four in number, continued to feed until the end of October, and are now hibernating. The two that pupated in September emerged on Oct. 23rd and 27th respectively, but unfortunately were not a pair. They have been kept in a corner of a room facing east, with the window generally open.—JAMES DOUGLAS; Sherborne.

ON THE HABITS OF *MACROTHYLACIA* (*BOMBYX*) *RUBI*.—In 'The Lepidoptera of the British Islands,' Mr. Barrett says concerning the larvæ of *Macrothylacia* (*Bombyx*) *rubi*, "It feeds vigorously through the summer, becoming full grown in the late autumn, when it reposes at full length on any plant or on the ground in the sunshine." My experience is that it never appears until after the sun has gone down. There is a field near here where they are abundant, but although I have searched, I have never found one in the sunshine; but immediately after the sun has gone down I could collect fifty or a hundred with ease. I am only referring to the late autumn; in the early spring I have no doubt that they come out in the sunshine, but I have not yet had an opportunity of finding this out. Mr. Newman says that the hairs of the caterpillar are abundantly intermixed in the cocoon. This also I have not found to be the case, although I must confess that my experience of the cocoon is limited to three or four.—L. M. SETH SMITH; Alleyne, Caterham Valley, Surrey, Nov. 13th, 1901.

CAPTURES AND FIELD REPORTS.

SPHINX CONVULVULI IN DORSETSHIRE.—During the month of September last I took twenty-nine *S. convolvuli*, flying about tobacco-flowers at dusk; they appeared each night the same length of time after the sun had set, practically to a minute. Those taken at the beginning of the month were much the larger, though not in such good condition. Two females in this batch measured no less than 124 mm. and 127 mm. respectively across the wings; the largest male 113 mm. The extreme given by Meyrick is 118 mm. Males were also much scarcer, numbering only six out of nineteen, while of ten last taken four were males. These last were smaller, and in absolutely fresh condition; the females apparently barren, there being no difference between them and the males in the shape or size of the body, while there was a decided and very apparent difference amongst the first lot. These data would seem to point to the fact that the later specimens were English bred; and they may also go some way towards explaining why *S. convolvuli* fails to become a permanent resident. It would be interesting to

know whether the experience of other collectors would confirm these deductions or otherwise.—JAMES DOUGLAS; Sherborne.

SPHINX CONVULVULI AND ACHERONTIA ATROPOS IN LONDON AND SOMERSETSHIRE.—One evening last autumn a living specimen of *Sphinx convulvuli* was brought to me to identify. It had been caught in Shore-ditch, flying to the light of a shop-window, and about the same time a specimen was sent me from Wellington, Somerset, which was found there at rest on a wooden post. About the beginning of October a very fine specimen of *Acherontia atropos* was brought to me, which had recently been taken at rest on the ground in a garden at Bow. This was in very fine condition; that is more than could be said of the specimens of *S. convulvuli*.—F. MILTON; 7, Chilton Street, Bethnal Green, Nov. 13th, 1901.

XYLINA FURCIFERA (CONFORMIS) IN LANCASHIRE.—Mr. C. H. Forsythe, of Lancaster, recently sent me a very nice photograph of a moth which he was unable to identify, and which I recognized as *X. conformis*. He states that he took two specimens when beating ivy blossom late at night, nearly 12 o'clock, on Oct. 22nd last.—RICHARD SOUTH.

CHARICLEA DELPHINII.—Two examples of this species have been presented to the British Museum by Mr. J. F. Bennett. These examples, which will be added to the British Collection of Lepidoptera at South Kensington, were obtained at Brighton in 1876, by Mr. Bennett's late father. It is not known whether the examples were captured or reared, but although slightly faded in colour they are in very perfect condition. The British history of this species is given by Mr. Barrett, *Lep. Brit. Islands*, vi. p. 145. The localities there mentioned are chiefly Berks and Middlesex, and the dates early in the last century.

XANTHIA (MELLINIA) OCELLARIS IN NORTH KENT.—I beg to record the capture of *M. ocellaris* in small numbers, at sugar, in a locality in Kent not far from Wilmington. In 1899 I took three; in 1900, three; and a friend who worked with me, a pair. This September I was too busy to go for the species, but I hope to work it up next year. *M. gilvago* and *M. citrigo* usually are freely taken with *M. ocellaris* in my locality. Three of these specimens are now in the cabinet of E. D. Bostock, Esq.—L. W. NEWMAN; Bexley, Kent.

LUPERINA DUMERILI AT DOVER.—I have the pleasure to announce the capture of a fine female of this rare Noctua, on a gas-lamp in this town, during the latter part of September. It would be as well to put on record that I have parted with the specimen, and it is now in the collection of Mr. Enstace R. Banks. —H. DOUGLAS STOCKWELL; 2, Albert Road, Dover, Dec. 16th, 1901.

OPHIODES LUNARIS IN CHESHIRE. — While sugaring at Delamere Forest, in company with Mr. A. G. Wallington, in June last, I took a large Noctua which neither I nor Mr. Wallington could identify; and it was not till a week or two ago, when some of my entomological friends of this town, Messrs. Womersley and Collins, saw it among my season's captures, that it was recognized as *Ophiodes lunaris*. I may add that this specimen was exhibited at the Entomological Society of London on Dec. 6th, and also at Chester by Mr. Collins on Dec. 9th. —T. WRIGHT; 13, Heath Side, Warrington, Dec. 12th, 1901.

TREATMENT OF PUPÆ DURING THE WINTER.—Some of us have found it difficult to rear imagines from dug pupæ of *Amphidasys betularia*, and a few other species, as they are so apt to dry up. By putting them in a small tin box, say a tobacco-box, with holes punched in it top and bottom, and burying it a few inches deep in the ground out of doors, I have obtained satisfactory results during the last two or three years. I put a few dry leaves on the top of the box to keep the mould from going through the holes into the box.—F. MILTON; 7, Chilton Street, Bethnal Green, London, E.

MACRO-LEPIDOPTERA IN NORTH STAFFORDSHIRE IN 1901.—The past season has been a very productive one in North Staffordshire, a large number of species having been taken that we had not met with before. Our first captures for the year were *Phigalia pilosaria*, *Hybernina progemmaria*, &c., and on March 31st one *Cymatophora flavicornis* was taken, and several more early in April, at rest on birch twigs. Other species noticed during April were *Anisopteryx æscularia*, *Anticlea badiata*, *Larentia multistrigaria*, *Trachea piniperda* (abundantly on sallow bloom, in company with *Taniocampa gothica*), *T. rubricosa*, *T. instabilis*, *T. stabilis*, *T. cruda*, &c.

May:—*Euchloë cardamines*, *Thecla rubi*, *Saturnia carpini*, *Venilia maculata* (in the Manifold Valley, very common in Dovedale), *Amphidasys betularia* (black var.), *Tephrosia crepuscularia*, *Bupalus piniaria*, *Abraaxas ulmata*, *Lomaspilis marginata*, *Emmelesia affinitata* (a few), *Hyppisipetes ruberata*, on the moors (the larvæ of this species we have taken not uncommonly some years on sallow), *H. impluviata*, *Scotosia dubitata* (one hibernated specimen). On the 28th two worn females of *Aeronycta menyanthidis* were taken on the moors, from one of which we obtained a batch of ova, and were successful in rearing fifty or sixty larvæ on sallow. *Hadena glaucawas* also fairly common.

June:—*Macroglossa stellatarum*, *Procris geryon* (common locally in Dovedale), *Chelonia plantaginis* (on the moors), *Odontopera bidentata*, *Asthena pulchra* (in the Manifold Valley near Dovedale), *Eupisteria heparata*, *Venusia cambricaria*, *Emmelesia alchemillata*, *Eupithecia ren-sata* (larvæ of this pretty species were taken from *Silene inflata* planted in the garden), *Melanthia ocellata*, *M. albicillata*, *Melanippe tristata* (common, but local), *M. galiata*, *Cidaria corylata*, *Aeronycta megacephala*, *Miana fasciuncula*, *Grammesia trilinea* (at light), *Abrostola urtica* and *A. triplasia* (at flowers of rocket, and at light).

July:—*Epinephele ianira*, *Zygæna filipendulæ*, *Nudaria mundana*, *Liparis auriflua* (at light), *Uropteryx sambucata*, *Larentia cæsiata*, *Anaitis plagiata*, *Cidaria pyraliata*, *C. dotata* (freely at light), *Plusia interrogationis* (a single specimen of this insect was taken, at rest, on a wall, on the moors, on July 8th).

August:—*Vanessa urticæ* (very common), *V. io* (this insect, which we have not seen for several years, has been fairly common during August), *V. atalanta* (not nearly so abundant as last year), *Gonepteryx rhamni* (a hibernated specimen of this butterfly, which is rare in the county, was seen in Dovedale on June 4th, also early in August, and a specimen was taken in the Manifold Valley on the 21st), *Ilalio varanaria*, *Oporabia filigrammaria* (a few on the moors at the end of the month), *Melanthia rubiginata*, *Cidaria ribesaria*, *C. testata*, *C. populata*.

C. fulvata, *Eubolia mensunria*, *E. bipunctaria*, *Charæas graminis*, *Noctua glareosa* (at flowers of heather), *Xanthia citrigo*, *X. cerago*, *Cirrhædia xerampelina* (this insect, which we had not taken previous to this year, was found in the Manifold Valley, where seven specimens were taken on Aug. 21st, and three more on the 25th; they were all found at the foot of ash-trees and on the surrounding herbage, between three and four o'clock in the afternoon), *Tethea subtusa* (bred from larvæ taken on poplar in June), *Cloantha solidaginis*, and *Gonoptera libatrix*.

Sugaring we did not try until early in September, when it proved exceedingly attractive. *Anchocelis litura* was on the trees in great numbers, together with *Hydrecia nictitans*, *H. micacea* (worn), *Agrotis suffusa*, *A. saucia* (two specimens), *A. segetum*, *Noctua glareosa*, *N. plecta*, *Orthosia macilenta*, *Anchocelis rufina*, *Xanthia cerago*. On Sept. 11th two specimens of *X. gilrigo* turned up in fair condition, and on the 18th two more were taken, also *X. ferruginea*, *Polia chi*, *Miselia oxyacanthæ* (and the dark brown var.), *Agriopis aprilina*, *Phlogophora meticulosa*, *Hadena proteus*. On Sunday the 29th, having occasion to pass the trees that had been sugared the previous evening, a fine specimen of *Vanessa c-album* was taken, feeding on the sugar; *Cerastis raccinii* and *Calocampa exoleta* were also taken early in October, and *Pæcilocampa populi* in November.—J. & W. HILL; 7, Westwood Grove, Leek, Staffordshire, Nov. 14th, 1901.

NOLA ALBULALIS AND NONAGRIA SPARGANII IN SOUTH DEVON.—I have this week had sent to me for determination one of two specimens of *Nola albulalis* captured in South Devon during the past season, but I am asked at present not to state the exact locality. It is a fine and well-marked example. I have also seen a *Nonagria sparganii* from the same district. Neither species has, I believe, hitherto been recorded for Devonshire, though I understand the latter has been known to occur in the county for two or three years or more.—GEO. T. PORRITT; Crosland Hall, near Huddersfield, Dec. 20th, 1901.

cor CORRECTION.—The hair-grass alluded to (Entom. xxxiv. 325) is probably *Festuca ovina* (small plants of this order are difficult to identify for certain), not *Aira cæspitosa*, as stated:—F. W. F.

ABUNDANCE OF MELITEA AURINIA IN CO. WESTMEATH.—I have been greatly struck by the abundance of the young larvæ of *M. aurinia* here this autumn. I searched for them in several localities where the food-plant is common, and in every case found them in numbers. In one locality, where they were specially numerous, I collected, I am sure, several thousand in less than half an hour, and could have taken plenty more. In one particular spot I counted no less than eleven of the webs which they spin, all within an area of about fifteen square yards; and as each web contained from about fifty up to several hundred larvæ, it will give some idea of their numbers.—B. L. MIDDLETON; Mullingar, Nov. 3rd, 1901.

VANESSIDÆ IN 1901. — I was specially on the look-out for these during last season, with the following results:—*Vanessa atalanta* was plentiful, although not so common as last year, but the specimens were very small, one measuring only 1½ in. *V. urticæ* was more

common than usual, and very fine specimens of this favourite insect frequented the gardens, seeming, with *V. atalanta*, to be especially fond of "everlastings." Not a single specimen of *V. io* was observed, but one fine specimen of *V. polychloros* was seen on Aug. 4th. Early I saw an hibernated specimen of *V. cardui*, although I had not seen any during 1900. The spot where I saw it was a favourite walk, and as I saw one on several other occasions, I at last came to the conclusion that it was a solitary specimen, and on July 17th I caught it, and found it to be a male. This was the only example I saw during the season, although I searched the neighbourhood well, and there are plenty of thistles and also plenty of "ling," of which, I believe, this species is fond.—A. MARSHALL; Cranbrook, Kent.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON. — November 6th, 1901. — The Rev. Canon Fowler, M.A., F.L.S., President, in the chair.—Mr. Arthur W. Bacot, 154, Lower Clapton Road, London, N.E.; Mr. Edward Martin Dadd, 3, Colina Villas, Green Lanes, Wood Green, N.; Mr. George Frederick Leigh, Musgrave Road, Durban, Natal; Mr. Rupert S. Lower, Oswaldton, Bartley Crescent, Wayville, South Australia; Mr. John Crampton Wilkinson Kershaw, Macao, China; Mr. Henry Woolner Peal, Indian Museum, Calcutta; Mr. Ethelbert Forbes Skertchly, Hong-Kong; and Mr. Arthur Smith, 5, Cavendish Street, Grimsby, were elected Fellows of the Society.—The Rev. F. D. Morice exhibited two imperfectly developed females of *Osmia leucomelana* found dead in a rubus stem at Woking, with their cases.—Mr. C. P. Pickett exhibited a series of *Colias hyale* taken at Folkestone during August, 1900–1, including one male dwarf, one male with smoky hind wings, one male with the edge of the hind wings showing a double row of serrated curves, three males with very deep yellow colouring and with spots in the centre of the hind wings twice the normal size, one male under side without spots, one male showing a row of black dots running parallel round the fore and hind wings, also one female with the edge of the hind wings showing a double row of serrated curves, one female with extra deep border to the fore wings, and one female with only half the usual border to the fore wings.—Mr. F. B. Jennings exhibited a specimen of *Trachypheus myrmecophilus*, Seidl., taken at Hastings in September last, retaining intact the deciduous "false mandibles," with the aid of which the imago of the species of this and certain other genera of weevils is said to work its way to the surface after emerging from the pupa under ground. These mandibles are usually shed as soon as the imago begins its life above ground, as there is no further use for them. — Mr. W. J. Kaye exhibited a collection of butterflies made by him in Trinidad, with several hitherto undescribed species. He said that the probable total Rhopalocerous fauna was about 250 species, the island—practically, the size of Somersetshire—being thus remarkably rich in butterflies. The number of the species in the families exhibited were: Nymphalidæ, 34; Satyridæ, 13; Papilionidæ, 6; Pieridæ, 31; Erycinidæ, 29; Lycænidæ,

27; Hesperiidæ, 62—nearly all taken within three or four miles of Port of Spain. The series of *Heliconius telchinia* and *Tithorea megara* var. *flavescens* were particularly fine, showing the yellow colouration only found in Trinidad and upon the coast of Venezuela immediately opposite. A long series of *Papilio xuevis* and *P. alyattus*, many of them bred from the same parent, female, show that these two are really identical species. The number of Erycinidæ in Trinidad compared with the poverty of the same family in other West Indian islands alone indicates the different origin of its fauna, and suggests affinity with the mainland of Venezuela, which at the nearest point is but seven miles distant.—Dr. Chapman exhibited specimens of *Parnassius apollo* taken last July in Castile and Aragon (Spain), as well as a number of specimens of both *P. apollo* and *P. delius*, chiefly Swiss and French, taken by himself, Mr. Tutt, Mr. A. H. Jones (at Digne), and Mr. Rowland Brown (at Susa, North Italy), for comparison with the Spanish specimens and to illustrate the extent to which the races of these species approached each other in Western Europe. The Spanish specimens differed from most of the others in their great size, the males reaching $3\frac{1}{2}$ in. in expanse, and the females $3\frac{3}{8}$ in. Both males and females seemed to be exceedingly close to the Asiatic form of *apollo*, called *hesebolus*, in general facies. The males placed between ordinary Swiss *apollo* and *delius* obviously incline much more to the latter than the former in general tone of colour and intensity of markings. The females were very large, and varied to forms with much increased red ocelli. The best character whereby to distinguish *apollo* and *delius* is certainly the black ringed antennæ, which are also usually proportionally shorter. The denser creamier colouring is also very characteristic, yet this would make the Aragon specimen *delius*. The pouch of the female appears to be identical in both species. The male appendages seem to have no ascertained structural difference beyond one in size, those of *apollo* being larger and apparently more solid. In the Spanish *apollo* this is markedly so, the differences, however, less proportionately than may be observed in *Erebia athiops*, of which the appendages of Continental specimens are so much larger than those of British examples.—Mr. G. C. Bignell sent for discussion a specimen of *Sphecophaga vesparum*, Curt., and the cocoon from which it had been bred. Mr. Donisthorpe expressed his opinion that the host was a ground wasp.—Mr. Gilbert J. Arrow communicated a paper upon "The Genus *Hyliota*, with descriptions of new forms, and a list of described species"; and Mr. W. L. Distant, "Contributions to a knowledge of the Rhynchota."

November 20th.—Mr. G. H. Verrall, Vice-President, in the chair.—Mr. James B. Casserley, 7, Gloucester Road, Finsbury Park, N., and Mr. M. Lawson Thompson, 35, Leven Street, Saltburn-by-the-Sea, were elected Fellows of the Society.—Mr. A. H. Jones exhibited various Lepidoptera from the Cevennes, including a series of *Lycæna dolus* var. *vittata*, *L. damon*, *L. meleager*, *Melanargia iapygia* var. *cleante*, and *M. galatea* ab. *leucomelas*; also a dark form of *Thais cerisyi* bred from a pupa received from Armenia. He also exhibited a specimen of *Vanessa antiopa* taken this year at Eltham, and two specimens of *Cerastes erythrocephala* bred from ova laid by parent moth captured at fallows near Canterbury.—Mr. H. Rowland Brown exhibited a re-

markable var. of *Melitæa didyma*, taken at Château de la Câze, Tarn, in which the black markings of the lower under-side wings were almost entirely absent; and a series of *Lycæna dolus* var. *vittata* from the Cevennes, with *L. admetus* var. *rippertii*, from Digne, showing the remarkable affinity of the two species, which, however, were never found on the same ground or in the same localities while collecting.—Dr. Chapman exhibited butterflies taken by himself and Mr. G. C. Champion in the Sierra Albarracin, Spain, last July. He said: "The district traversed by Mr. Champion and myself was practically the same as that described by Mrs. Nicholl in the 'Transactions' for 1897, and not many new butterflies were added to Mrs. Nicholl's list. *Z. quercus* was taken at Tragacete, but this is in Castile, not in Aragon. *Augiades sylvanus* was taken both at Albarracin and Tragacete. *Adopæa actæon* was met with at Cuenca (Castile), while *Adopæa linea* seemed to be more abundant than *lineola* at all stations. *L. hylas* and its variety *nivescens* occurred on the same ground. The common form of *L. corydon* seemed to be *corydonius*, or near that variety; this was especially abundant at Tragacete, and was met with at all other places. The very large pale form *hispana* was the commonest at Albarracin, where the *corydonius* form was rare, and at Cuenca, and was not seen at Tragacete. Looking at these and other dimorphic forms occurring here, one could not help questioning whether *admetus* might not be a dimorphic form of *damon*. The former was often abundant, the latter always rather scarce. The females, however, have constant differences, and the general tone of colour and arrangement of spots on the under sides seem abundantly sufficient to satisfy one that they are definite species, though very closely allied. *L. dolus*, however, seems to precisely occupy the relation to *damon* that *nivescens* does to *hylas*, and that the vars. *hispana* and *albicans* do to *corydon*. The male appendages of the three—*damon*, *dolus*, and *admetus*—appear to be identical. We observed nothing to account for or explain the use of the colouring of *Satyrus* var. *uhagoni*. It resembles very much the female of *semele*, which is abundant on the same ground. But the habits of flight of the two are very different, and we never in fact mistook one for the other. The brown colour is no doubt the original one in the Satyrids, but in this case is more probably a reversion."—Mr. L. B. Prout exhibited a number of Geometridæ, also taken by Dr. Chapman and Mr. Champion in Spain. — Mr. F. Merrifield exhibited specimens of *Pieris rapa* and *P. ergane* from Dalmatia, showing that the two species are extremely difficult to separate, even if they are not identical.—Mr. C. P. Pickett exhibited varieties of *Argynnis paphia* and *A. aglaja* from the New Forest.—Mr. C. J. Watkins sent for exhibition micro-photographs of the larva in its case and the perfect insect of an *Oxyethira*, one of the Hydroptilidæ, a family of Micro-Trichoptera, these had been taken by Mr. Mearns, of Aberdeen. Also a drawing made by himself under the microscope of a larva (in its case) of the same genus.—H. ROWLAND BROWN, *Hon. Sec.*

SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—October 24th, 1901. — Mr. A. Harrison, F.L.S., in the chair. — Mr. West (Greenwich) exhibited about ninety species of British Homoptera, mainly taken by himself, and which he generously gave to the Society's collection.—Mr. Barnett, a long series of *Bryophila muralis* (*glandifera*)

of a somewhat dull coloration, from Shorncliffe, and a series of *B. perla*, including one particularly dark form.—Mr. W. J. Kaye, two species of Lepidoptera new to science, discovered by him at Bartica, British Guiana, during a collecting expedition this year, viz. *Papilio* sp.? near *P. latinus*, and a Sphingid *Ambulyx* sp.? near *A. strigilis*. — Mr. H. Moore, specimens of *Sphinx convolvuli* taken at Rotherhithe this autumn, and an example of *S. ligustri* bred from a larva found in the same place.—Messrs. Harrison and Main, six specimens of *S. convolvuli* taken at the electric lights on the Romford Road, E. — Mr. R. Adkin, bred series of *Plusia moneta* from larvæ found in a garden at Bexley, and a bred series of *P. gamma* from eggs laid by a female which flew into his house. He contributed notes on the occurrence, feeding, and habits of the latter species. Mr. Adkin also showed a series of *Boarmia repandata* taken by Mr. McArthur in the Isle of Lewis in 1901. The latter gentleman exhibited the same species, captured in 1887 and 1901 in the same place; also a case set up to show the resting habit of the species on the rocks. He also showed a series of *Melanippe sociata* var. *obscurata* from the same locality.—Mr. Main, an unusually large specimen of the spider *Tegenaria domestica*. — Dr. Chapman, *Acontia urania*, a beautiful North American Noctuid he had bred, and three New Zealand specimens of a species of *Oeketicus*.

November 4th.—Mr. W. J. Lucas, B.A., Vice-President, in the chair. Mr. Lowe, of Putney, was elected a member. — Messrs. Harrison and Main exhibited a long bred series of *Agriopis aprilina* from the New Forest, and series of *Calocampa exoleta* from Delamere Forest.—Mr. Moore, a trap-door spider's nest from Corfu.—Dr. Chapman, long and varied series of *Parnassius apollo* and *P. delius* from various European localities, with many intermediate forms. — Mr. Percy F. Smith gave a lecture on "Spiders," illustrated with a large number of lantern slides.—HY. J. TURNER, *Hon. Report Sec.*

RECENT LITERATURE.

D. W. COQUILLETT. *A Systematic Arrangement of the Families of the Diptera.* (1901 Proc. U. S. Nat. Mus. xxiii. pp. 653-8.)

THE old Latreilleian primary divisions (1805) are adopted, with names "*Proboscidea*" and "*Eproboscidea*" (Pupipara).* The latter embraces the families Nycteribiidæ and Hippoboscidæ, and is considered to differ so importantly from the other forms in structure, habits, and reproduction, as to justify its separation into a group equivalent to all the other Diptera. The Tipulidæ are placed at the lowest rung of the Proboscidea, on account of their "comparatively large size, elongated form, weak organization, numerous, many-branched veins, and long, many-jointed antennæ." At the head are the Borboridæ, a family of Muscæ Acalypterae.

The Proboscidea comprehend the Orthorhapha and Cyclorhapha; the former with two subsections, *Nemocera* (Tipuloidea with eight

* The name "*Proboscidea*" as limited by Latreille and Coquillett is much more extensive than that of Schiner and other dipterists.

families, and Bibionoidea with five families), and Brachycera (Tabanoidea with six families, Bombylioidea with three, Asiloidea with five, and Phoroidea with two families). The Cyclorhapha are divided into two superfamilies, Syrphoidea (with four families) and Muscoidea (Calyptratae with six, and Acalypterae with nineteen families).

G. W. K.

S. H. SCUDDER. *Pink Grasshoppers*. (1901 Entomological News, xii. pp. 129-131, Plate (coloured) vi.)

MANY of the Grasshoppers with elongate antennæ occur in two colour-forms, either leaf-green or dead-leaf brown, there being no structural differences noticeable. Very rarely (less than a dozen times) they have been found of a delicate violet or pink colour, and these are considered by Mr. Scudder to be "sports." Two examples of *Amblycorypha oblongifolia* from Massachusetts are figured; the female is a delicate coral-red colour, while the male is tinged with orange. The eyes are green in both. The causes of this remarkable colouring are quite unknown, and Mr. Scudder's specimens were healthy and behaved quite normally.

E. D. BALL records under the varietal name of *pata* a pink form of the green *Macropsis lata*, Uhler (1900 'Psyche,' p. 130).

G. W. K.

AMONG recent papers of general interest may also be mentioned:—

Diptera.—A curious case of gynandromorphism is recorded in *Hilara wheeleri*, Melander, from Wyoming, U.S.A. The species of *Hilara* mostly exhibit striking sexual dimorphism; for example, the first segment of the anterior tarsi is greatly enlarged in the male, but of normal shape in the female, this character varying considerably among the various species. The individual in question has the abdominal styles of the female, but the enlarged legs of the male. It is remarkable that in the same locality and at the same time a specimen of *Dilophus tibialis*, Loew, was taken which possessed an antennary appendage arising from the right anterior coxa. (A. L. MELANDER in 'Psyche,' 1901, pp. 213-5; 2 figs.)

Rhyuchota.—D. VON SCHLECHTENDAL: *Trama troglodytes*, Heyden, a singular Aphid (Zeitschr. für Entom. vi. pp. 245-55; 14 figs.).

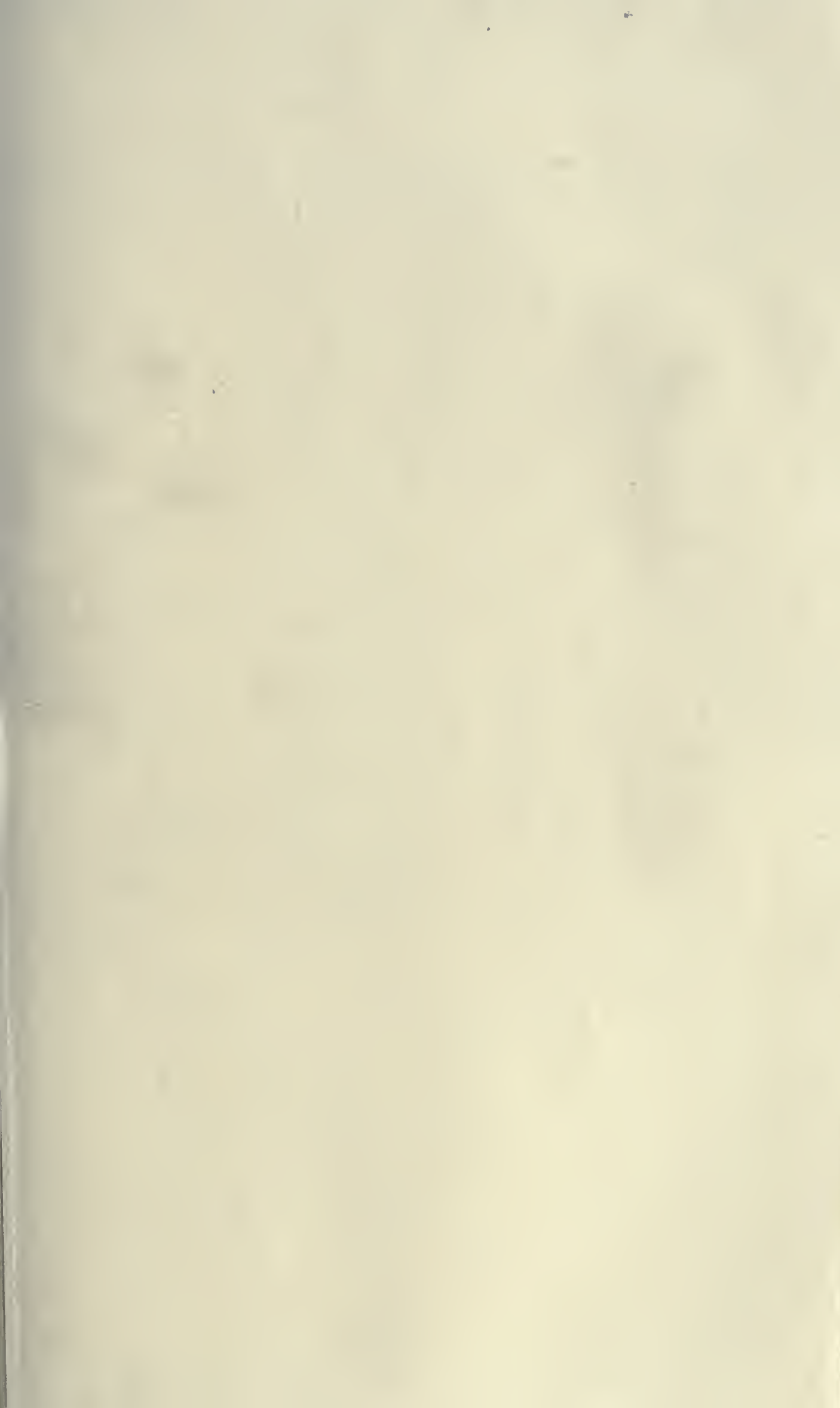
Lepidoptera.—C. SCHRÖDER: Experiments on the Transference of Characters in the Larval State, for ex. in *Tephroclystia vulgata* (t. c., 255-8; 2 figs.).

Neuroptera.—L. KATHARINER: On the Biology of *Perla maxima*, Scop. (t. c. 258-60; fig.).

Lepidoptera.—C. OBRTHÜR: Observations upon the Lepidoptera of the English Fauna (Feuille jeunes naturalistes, pp. 12-17). We propose to consider this at greater length in our next number.

Lepidoptera.—E. MORY: On some New Swiss Hybrids of the Genus *Deilephila* (M. T. Schweiz. Entomol. Gesellsch. x. pp. 333-60; plate).

G. W. K.





W. J. Lucas, del.

Nymph of *Oxygastra curtisii*, Dale ($\times 4$).

a. Labium (mask) flattened out ($\times 4$).

b. Region of moveable joint (much more highly magnified).

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DRAGONFLIES IN 1901.

By W. J. LUCAS, B.A., F.E.S.

THOUGH there is no record of the capture of a new species to be made for the year 1901, yet in some respects the season was an interesting one. The earliest imago noted was a male of *Pyrrhosoma nymphula*—at the Black Pond, in Surrey, on April 28th. By May 12th, three or four species were on the wing at the same place, though even on May 19th such early species as *Calopteryx splendens* and *P. nymphula* were still in the teneral condition at Send, also in Surrey. But during the summer weather at Whitsuntide, which fell at the end of May, dragonflies were numerous, some ten species being noticed on the wing in the New Forest during the week-end.

Sympetrum striolatum was, of course, noticed at several new localities, amongst them being Cumbræ, in Buteshire (A. M. Stewart); Frensham Great Pond, in Surrey (E. B. Bishop and W. J. Ashdown); Pokesdown and Stour side, in Hants; and Totness, in Devon. The species was very plentiful on Esher Common in the autumn, as was also *S. scoticum*. The latter was found at Pokesdown, in Hampshire, and a large number, all practically normal in size and colouring, were received from Rogart and Lairg, in Sutherlandshire (J. M. Munroe).

Libellula depressa was common and mature in the New Forest between May 25th and 28th. It was found in several districts in Yorkshire (G. T. Porritt); and near Bedford (R. W. Thompson). *L. quadrimaculata* was first seen at the Black Pond on May 12th; on June 9th it was in considerable numbers there, and a var. *prænubila* was taken; it was still about on July 8th. It was found at Frensham Great Pond, Surrey (E. B. Bishop); Mr. C. A. Briggs received some specimens from Mr. McArthur, taken at Stornoway, in Lewis; and Mr. A. M. Stewart sent me one taken by Mr. Dunsmore in July in the island of Arran (Scotland). British odonatists

will be pleased to hear that the capture of four more specimens of *I. fulva* may be added to the very short British list—three females and one male—all taken in 1900 and 1901 between Bournemouth and the New Forest. The captures were made by Major Robertson, who works so assiduously the insects of Dorset and Hants. The male had not obtained its blue colouring, one of the females was very immature, and one at least had the black tip to the wings.

Orthetrum cærulescens was seen in the New Forest, sparingly and in teneral condition, between May 27th and 28th; it was very common there as usual in August. *O. cancellatum* was found on July 7th at Frensham Great Pond, in Surrey, by Messrs. E. B. Bishop and W. J. Ashdown.

Perhaps the most important feature of the season was the taking of *Oxygastra curtisii* by Major Robertson in the old locality near Christchurch, in Hampshire. But one capture was made, and in fact, though several visits were made to the locality, only a few specimens in all were seen. On one occasion the net was successfully placed over a female, but she managed to escape. The single specimen taken was given to me, and is a male in perfect condition. The last previous capture of the species was in 1882, when four males were taken. Two visits paid by myself to the locality, on July 31st and on August 7th, failed to reveal its presence, and we must conclude that the insect is over by that date. The spot where *O. curtisii* occurs is not its breeding ground clearly, and the question arises, where is the nymph-stage passed? A drainage-pond near at hand, which apparently disappears in dry weather, cannot be the place, and a little stream, which at times is found connected with the pond, seems equally out of the question. The probability is that the species breeds in the Stour, a clear, swift stream, often deep, running over pebbles and gravel, about a quarter of a mile away. By the kindness of a French naturalist, M. René Martin, of Le Blanc (Indre), I am able to give a description and figure (Pl. 1) of the nymph of *O. curtisii*, made from empty cases which he sent to me, and which were obtained from river-banks in the centre of France. The skins received were not in very good condition, and the species in the nymph-stage being hairy and rugose, the skins were covered with earthy matter which was not easily removed. It is likely, also, that many hairs and bristles were broken off. When living specimens come to hand, it may be found necessary to modify the description a little, especially with regard to the thorax, and possible also the figure may need a little amending where the skin was ruptured by the emergence of the imago. DESCRIPTION: *Length*, from front of face to end of appendages, 21.5 mm.; *greatest width of abdomen*, about 9 mm. *Colour*, a more or less uniform dark brown. *Head*, transversely 6 mm., somewhat less longitudinally; pentangular; surface chiefly rugose, except a few smooth patches, notably three on occiput; a ridge

of hairs between antennæ, a tuft on the vertex, and two tufts containing some very long hairs (or bristles) on occiput; hind margin of occiput concave. *Eyes* small, bluntly conical (nearly spherical) at front lateral corners of head. *Antennæ* 7-jointed; basal two short and swollen; next three rather longer, more slender, and each with a long hair; distal two longer and quite slender, possibly having had a whorl of hairs at one time; length of antennæ about 4 mm. *Mask* (Pl. I. *a*) large, deeply spoon-shaped, covering the face, and reaching back to the insertion of the mid-legs; median lobe obtusely pointed with slopes slightly concave; lateral lobes with outer lateral margin slightly concave, inner lateral margin convex, distal margin finely crenated and divided into eight teeth, each bearing spines, on some teeth as many as six in number (Pl. I. *b*); moveable joint rather short, blunt*; mental setæ, eleven in each comb; lateral setæ, about seven on each side (eight in one case). *Prothorax* narrow, produced laterally into a point on each side bearing a few long stiff bristles. *Pleura* rugose, with a few long stiff bristles. *Wings* rough, with scattered long stiff bristles like those on pleura. *Legs*, fore about 10.5 mm. long, mid about 15 mm., hind about 18 mm.; hairy except, apparently, femora of mid and hind pairs, which, however, are rough; they all bear a number of long, scattered, stiff bristles (many broken off); the femora with a couple of dark bands. *Abdomen* very rugose; stiff hairs along the distal margin of the segments, these being longer in the mid-dorsal line; one or two still longer stiff bristles among the rest on most of the segmental margins; a slightly lighter mid-dorsal line, the colour being a little darker on each side of it; lateral margins hairy, especially in tufts near the front and back of each edge of the segment, on segment nine the marginal hairs much longer; lateral hooks on segments eight and nine, those on nine being much the longer; no dorsal hooks. *Appendages* rough, pointed, hind ones a little longer than dorsal one, laterals rather more than half hind ones.

Gomphus vulgatissimus was found fairly numerous between 25th and 28th May by one of the streams in the New Forest; but specimens were as a rule not very easily taken. They were at that date rather immature, and were generally seen settled upon, or flying round, some of the larger bushes and small trees. Near Oxford, Messrs. A. H. Hamm and W. Holland found the range of this insect to be rather more extended than previously.

Cordulegaster annulatus was common in some parts of the New Forest in August, and on the 3rd of that month a female was watched as she was ovipositing in Blackwater stream by flipping the tip of her abdomen rather forcibly, but apparently

* Possibly the points may have been broken off in specimens mounted for microscopical examination; but all were alike.

quite at random, into the water—in one place amongst loose gravel-stones, where practically no water remained. On August 7th, one was taken near the Stour, at Pokesdown. Mr. G. T. Porritt reports the species from Yorkshire.

Dr. F. A. Walker reports a female *Anax imperator*, taken on Hampstead Heath on May 11th. On June 9th the species was common at the Black Pond as usual. On June 26th, one female at least was watched ovipositing at Byfleet Canal on a large *Potamogeton*, sometimes in the leaf-stalk, at others in the leaf itself, apparently. Messrs. Bishop and Ashdown saw the insect, on July 7th, hovering over Frensham Great Pond.

Brachytron pratense. In the spring a number of nymphs were procured by Messrs. F. Enock, S. W. Kemp, and myself at the Byfleet Canal, in Surrey, and at the Black Pond; and, later, Mr. Enock bred a fair quantity. When dredged up on a rotting piece of dead bulrush or sedge, their resemblance to it in form and colour is perfect, and the position taken up is well adapted either to enable them to lurk unseen for their unsuspecting prey, or to conceal their presence from some dangerous enemy. The habit they have of remaining perfectly inactive when taken or touched assists also in the same direction. Imagines were common at Byfleet Canal on June 1, and on June 16th I took a female at rest at the Black Pond—still another new record for that prolific locality.

Æschna mixta has again been comparatively common in the South of England, possibly in consequence of an immigration, though personally I think not. The species was again quite numerous at the Black Pond in September. It was noticed singly at several places in the New Forest in August—a female near Rinefield on August 5th, a male at Denney Bog on August 10th (A. B. Higgs), a female at Lady Cross on August 13th, a male near Beaulieu Gate on August 15th. In Epping Forest a female was taken on September 12th (F. W. Campion), and a male on 20th September (H. Campion), both near Chingford. A male (12th August) was sent to me from the golf-links at Deal (R. J. McOnie). *Æ. juncea* did not come across my path once during the season, but Mr. A. M. Stewart reports it from near Paisley, in Renfrewshire, and Mr. C. A. Briggs received the species through Mr. McArthur from Stornoway. Of the common species, *Æ. cyanea* and *Æ. grandis*, it is scarcely necessary to speak, except to say that the latter seemed to be specially common in one or two places. Possibly other collectors may have noticed the same thing. *Æ. cyanea* was taken (A. B. Higgs) in the New Forest, and near Bedford (R. W. Thompson), both new records.

Calopteryx virgo was taken at Tubney Wood, in Berks (W. Holland), on June 2nd. It was a brown male, and if mature, as it appeared to be, was var. *anceps*. On August 5th I noticed one in the New Forest which had a very peculiar appearance as it

flew, and, a capture being made, it was found that part of one of the wings was quite bleached. Major Robertson shewed me a specimen of *C. splendens*, taken at Holmslea, in the New Forest. The species has not, I believe, been previously noted for the Forest. On June 9th, three or four specimens were seen at the Black Pond, one apparently being a female; they no doubt had migrated thither from the river Mole.

Lestes sponsa was reported from Renfrewshire, near Paisley (A. M. Stewart). The presence of *Platynemis pennipes* was noticed near Byfleet station; previously it had only been noticed much nearer Weybridge. On July 24th the same interesting species was found, by no means singly, at the Black Pond (R. South); but one specimen had previously been recorded for that locality. One specimen, at least, was seen in the New Forest, between May 25th and 28th, the previous earliest I had noted being June 6th.

Pyrrosoma nymphula has to be recorded from Renfrewshire, near Paisley (A. M. Stewart), while Mr. C. A. Briggs has received some Stornoway specimens from Mr. McArthur. *P. tenellum* was, as usual, common in August in the New Forest, where a female of var. *rubratum* was taken on August 10th (S. W. Kemp), and two females, intermediate between the type and var. *æneatum*, on July 28th and August 5th.

Ischnura pumilio was beginning to appear on May 27th in the New Forest, and it is possible that it was not uncommon somewhat later, but not one could be seen by the end of July. On May 27th and 28th they were found chiefly on swampy ground, amongst bog-myrtle, and some circumstances seem to point to the fact that they may possibly breed in this swampy ground rather than actually in the streams or pools. All but one of the females I have taken belong more or less pronouncedly to var. *aurantiaca*. *I. elegans* was taken at Stornoway by Mr. McArthur for Mr. Briggs; the specimens, three males and one female, were rather small. Mr. A. M. Stewart took the species near Paisley, in Renfrewshire. Messrs. Bishop and Ashdown captured it on July 7th at Frensham Great Pond, while Mr. South found it not uncommon, on July 24th, in one corner of the Black Pond, single specimens only having been noticed there before. The orange var. *rufescens*, Steph., was taken at Byfleet Canal on June 1st and 26th.

Agrion pulchellum was taken on June 5th, near Oxford (W. Holland), thus adding a new locality to the rather meagre list for this pretty dragonfly. The capture of a male, with the U-shaped spot on the second segment detached from the circlet, has already been noted in this magazine (Entom. xxxiv. p. 215). *A. puella* was taken in Renfrewshire, near Paisley, by Mr. Stewart, and a male was taken, presumably in Epping Forest, in which there was a median black line, converting the typical U-shaped spot on the second segment into a trident (H. and F. W. Campion). Both

sexes of *A. mercuriale* were taken in the New Forest between May 25th and 28th, and the species was still on the wing in the beginning of August. Mr. Stewart took *Enallagma cyathigerum* in Renfrewshire, near Paisley, and Messrs. Ashdown and Bishop captured it, on July 7th, at Frensham Great Pond. Mr. McArthur captured for Mr. Briggs twenty-four specimens at Stornoway—twenty males and four females. The specimens were of good size, and in most cases the spot on the second segment was large—in one or two cases similar in shape to that on the specimen figured in the Ent. Mo. Mag. for 1890, p. 110. On June 26th, at Byfleet Canal, I noticed a pair united *per collum*, and settled upon a leaf of *Potamogeton*, in which the female seemed to be ovipositing without going below the surface of the water.

DESCRIPTION OF A NEW SPECIES OF GALL-MAKING CYNIPIDÆ FROM THE N.W. HIMALAYAS.

By P. CAMERON.

CALLIRHYTIS SEMICARPIFOLIÆ, sp. nov.

Ferrugineous; the antennæ, except the basal two joints, the head, the greater part of the middle lobe of the mesonotum, the scutellum, median segment, the pro- and mesopleuræ, except above and the back of the abdomen, black; the legs lighter coloured than the body, with the tarsi and hinder tibiæ darker; the wings clear hyaline, the nervures blackish, the cubitus paler. ♀. Long. 2.5 mm.

Hab. North-West Himalayas.

Antennæ bare, as long as the body. Head shining, finely aciculated, bare. Except at the base, the middle lobe of the mesonotum is rather strongly transversely striated; the lateral lobes are minutely, obscurely punctured. The parapsidal furrows are complete. Scutellum irregularly punctured, its sides at the base are bordered by shining, smooth furrows; in the middle at the base are two narrow, longish foveæ. The scutellum is roundly convex, and is not much raised above the level of the mesonotum. On the base of the median segment is a smooth, shining semicircular broad keel, which is not quite so broad in the middle as on the sides. The upper edge of the propleuræ and the mesopleuræ at the base above are rufo-testaceous. The median segment bears a thick, white pile. Abdomen smooth and shining; the base and ventral surface are broadly black. The legs have a microscopic white pile. Wings long and narrow, clear hyaline; the transverse cubital nervures and the cubitus are paler than the others. The areolet is completely closed, slightly oblique, and triangular.

The third joint of the antennæ is not much longer than the fourth; the tarsal claws are unidentate; the antennæ are slender and do not become thickened towards the apex; the radial cellule is long and narrow and is not quite closed at the base, the nervure being faint

towards the costa; the median segment is hollowed at the base below the curved keel and, in the centre of this part are three not very distinct, short, stout longitudinal keels.

This species was reared from an acorn collected by Mr. E. P. Stebbing from *Quercus semicarpifolia* in North-West Himalayas. It agrees better with *Callirhytis* than with *Andricus*. One of the European species of *Callirhytis* galls acorns. The Indian oak-galls are quite unknown; and there must be a splendid field for any naturalist who would undertake their investigation. The type of the species here described is in the British Museum.

ON METHODS USED TO PRESERVE COLOUR IN RELAXING ENTOMOLOGICAL SPECIMENS.

BY COLONEL J. G. PILCHER, F.R.C.S.

LIKE most of my fellow-workers in Entomology, my attention was early called to the invariably altered colour of nearly all the blue and green moths submitted to moisture in the relaxing-box; no specimen wholly retained its primitive colour, but became more or less yellowed in the process of relaxing.

The only exception to this rule were the fresh specimens which it has been my custom to put into a moist atmosphere until the *rigor mortis* had passed, when they were entirely freed from all rigidity, and yielded therefore more readily to the touch of the needle than if they had been pinned and allowed to partially dry before they are mounted. In passing I would note the very great help this method has afforded in dealing with all fresh forms, but especially with the small muscular Noctuidæ. In fresh specimens discoloration was not so frequent, though it occasionally did take place in fresh specimens submitted to a moist atmosphere for only a few hours.

The thought occurred to me in 1889 that the cause of discoloration was free ammonia, due to the decomposition which must be presumed to begin in the killing-bottle, and is renewed with greater energy when many dried specimens are put into the relaxing-box at one time. And even before the alkali has tainted the atmosphere of the relaxing-box it would have been conducted to all parts of the specimen by its nervures and their branches.

A volatile acid suggested itself as a fit antagonist to the ammonia, and carbolic acid seemed specially suitable, but its vapour was apparently not diffusive enough, nor did it neutralize the ammonia as produced.

Glacial acetic acid was found to answer best. I placed a small capsule or measure-glass of this acid in the relaxing-box—

60-90 drops as a charge—and renewed it as it evaporated, and this method I have used for many years.

The relaxing-box or vessel which appears to afford advantages above all others is a glass cylinder, covered with a round disk of glass ground to fit accurately. Into this cylinder is placed a tripod of glass, to hold the clock-glass upon which the specimens are to rest. Distilled water to the depth of half an inch is put into the cylinder. The latter is then placed over a Bunsen's burner, with wire gauze over it, and the water allowed to boil for five minutes or more. On allowing the vessel to cool, a partial vacuum is produced, and the cover must be removed with care some hours afterwards, when the specimens to be relaxed and the acetic acid are then inserted.

The vessel cannot remain completely sterilized because of the frequent movement of specimens to and from it, but heat can be applied from time to time, and it can be kept, as free as possible, from those spores which do germinate with marvellous rapidity in the saturated atmosphere of the relaxing-box.

The requisites for this relaxing-chamber can be procured for a few shillings from Messrs. J. J. Griffin & Sons, 20, Sardinia Street, Lincoln's Inn Fields, W.C.

A casual remark by Sir Geo. Hampson on the loss of colour of specimens in the relaxing-box led to an explanation as to the method I adopted, which he has been good enough to test for several months in the Natural History Museum, and with such satisfactory results that he encouraged me to make a note of the method for the benefit of fellow-workers.

These notes are the reply to his request, which it gives me great pleasure to send to him.

5, Stanley Crescent, W.: 16 Jan., 1902.

DESCRIPTIONS OF THREE NEW BUTTERFLIES FROM EAST AFRICA.

By EMILY MARY SHARPE.

ACRÆA BAXTERI, sp. n.

Closely allied to *A. insignis*, Distant, but is at once distinguished by the clear transparent band on the apical area of the fore wing.

Primaries. Basal half ferruginous red, the outline irregular where it joins the dusky brown terminal portion of the wing; a transverse line of three transparent spots, situated above the third median nervule, and between the first and second radial nervules, thus relieving the apical area of the wing. Costa dusky brown, the extreme base with black streaks, one of the latter extending for a little

way along the inner margin. *Secondaries*. The entire discal area ferruginous, the basal half decidedly black, faintly suffused with ferruginous towards the costal margin; the hind margin narrowly lined with brownish black; the veins on both wings blackish. *Under side*. Primaries similar to those of *A. insignis*, but showing the transparent band, and with the general colour somewhat lighter. Secondaries more sombre in colour than in the allied form; the discal area greyish white, relieved by the black nervules, the hind margin having deep chestnut-brown spots between the nervules; the basal area chestnut-brown, thickly spotted with heavy black dots, a distinct line of these spots outlining the outer edge of the basal half of the wing. Expanse, 2·1 in.

Hab. Mpapwa, German East Africa (Dr. J. W. Baxter).

ACRÆA OCHRASCENS, sp. n.

Similar to the species of the *A. serena* group, but distinguished by the pale yellow ground colour of the wings.

Primaries. General colour pale ochre-yellow, the brown spots and markings agreeing with those of *A. serena*, Fabr., but somewhat lighter in colour; the hind marginal border relieved by six small spots of pale ochre, tinged with deeper yellow. *Secondaries*. Ground colour pale ochre-yellow; the brown hind margin with the lighter dots similar to those of the primaries; basal area dusky brown; a faint black streak visible at the end of the cell. *Under side*. Primaries pale yellow, slightly darker in colour on the hind margin; the light nervules heavily streaked with black on the marginal area; the usual black mark at the end of the cell much reduced in size. Secondaries: Ground colour pale yellow, with the usual black and red spots on the basal area; the hind marginal border consisting of spear-shaped marks outlined with black, the usual light nervules having black streaks down the centres; between each of these hastate marks are distinct spots of ferruginous red; this submarginal border broadest near the costa and towards the anal angle; on the extreme edge of the marginal border a row of light yellow spots, but slightly smaller than in *A. serena*. Expanse, 1·1 in.

Hab. Entebbe, Uganda, March to May, 1895 (F. J. Jackson coll.).

ELYMNIA RATTRAYI, sp. n.

Similar to *E. phegea*, Fabr., in colour, but easily distinguished by the white band on the secondaries. The female closely resembles *E. bammakoo*, Westw., but the white mark on the primaries is larger, and the white streak on the inner margin is only faintly indicated, while the white band on the secondaries is almost obsolete.

♂. *Primaries*. Ground colour of the primaries brown, crossed near the apical area by a broad transverse band of bright yellow, extending a little below the first median nervule; an ovate spot of yellow near the posterior angle, and almost connected to the conspicuous yellow band by a faint suffusion of yellow. *Secondaries*. A broad

border of brown along the hind margin, this colour again represented on the basal area, with a distinct white band crossing the centre of the wing, and becoming narrower towards the costal margin. *Under side.* Basal area of the primaries brown, with fine wavy lines of white in the discoidal cell; the yellow band distinctly indicated, and extending to the hind margin between the first and second median nervules; the apical area lighter brown, thickly covered with wavy lines of brownish white. Basal area and costal margin of the secondaries deep reddish brown, relieved by five lines of black, somewhat disconnected towards the extreme base; the white band streaked on the inner margin with brown; the broad hind marginal border of brown thickly traversed by innumerable wavy lines of brownish white. Expanse, 8 in.

♀. *Primaries.* General colour brown, relieved by a large white band near the apical area, extending just over the first median nervule; a faint streak of white visible near the centre of the inner margin. *Secondaries.* Ground colour brown, with an almost obsolete band of greyish white crossing the central area of the wing; this colour most strongly pronounced towards the inner margin. *Under side.* Primaries similar to those of the male, with the exception that the white band is replaced by a yellow one; between the first and second median nervules are two tawny yellow spots. Secondaries not different in colour and markings from those of the male above described. Expanse, 8.1 in.

Hab. Entebbe, Uganda, June, 1900 (Capt. H. B. Ratray).

NOTES AND OBSERVATIONS.

GORDIUS IN A BUTTERFLY.—In the 'Entomologist,' vol. xxv. (1892), p. 247 and 291, is a notice of a hair-worm emerging from a butterfly. I have met with a precisely similar case. A specimen of *Erebia euryale*, female, taken at Mendel (Tyrol) in 1895, presents, on being taken out of paper, two ends (of one or two worms?) of *Gordius* projecting from the cephalo-thoracic joint; they are brown, coiled, and shrivelled, but, even so, are each between a half and three-quarters of an inch long, and would probably be about one inch and one and a half inch respectively, if straightened out. One often meets with these worms emerging from larvæ, especially in some seasons, but they are decidedly rarer in imagines. These two cases are curiously parallel in both being Satyrids, in the worm emerging at the same point, and in their giving no evidence of their existence at the time the insect was captured. The interest of these specimens is chiefly in their being exceptions to the almost invariable rule, that parasites in the Lepidoptera destroy their hosts before they reach the imaginal stage.—T. A. CHAPMAN; Betula, Reigate, January, 1902.

NOTODONTA DRYINOPE, Lower.—It has already been shown how the large Antherææ cut out of their hard and tough cocoons (*ante*, p. 10). I now have pleasure in furnishing notes upon the above insect, which also constructs a hard but more breakable cocoon. These cocoons are formed mostly of small fragments of bark and wood, bitten out of the

surface around which the cocoon is constructed. Upon examining a cocoon, a piece will be found to have been removed for the escape of the moth; this piece is not broken out, but is cut or pierced out, the fragment usually falling back into its place when the moth emerges. I have not observed the insect removing this roundish piece, but as I cannot detect any special instrument in the moth, there can be only one explanation as to the manner in which it is cut out, *i. e.* that it is done by the *chrysalis*, for the remarkable spike with which it is provided can be for no other purpose than for piercing the cocoon; this instrument is really double, though it looks like one piece. It is certainly extraordinary how the *chrysalis*, which is shorter than the cocoon, can expand sufficiently to be enabled to bring this spike to work upon the upper end of the cocoon. All the "*Zeuzeridæ*" pupæ are provided with stout but blunt "beaks," each species different, with which they break or push out, whole, the strong and thick wad which encloses them in their bores; they then work halfway out of their bores before they split open their shells, and the moths crawl out; but this sharp-spiked pupa is altogether strange in my experiences. I regard it as extremely probable that many other of our *Bombycidæ*, which construct hard cocoons, are provided in the pupal state with special cutting or breaking instruments. Several of the "*Xyloryctidæ*" (*Tineidæ*) are provided with extraordinary head-pieces to enable them to get through the thick "felt"-like constructions with which they securely fasten themselves in their chambers. This by the way. Reverting to our *Notodonta*, it may be noticed that the larva is a queer-looking creature, with its flat and widened out tail-segments; this tail is turned over the larva's back when it rests; it is veined, and so formed as to present a striking resemblance to a young leaf of the tree (*Terminalia*, sp.?) upon which it feeds. The full-grown larva is dull green, head nearly black; very small caterpillars are coffee-brown; they all have the raised, flattened-out "tail," which, however, is lowered during progression.—F. P. DODD; Warburton Street, Townsville, Queensland.

NOTE ON A HABIT OF *CYANIRIS (LYCÆNA) ARGÏOLUS*.—*C. argiolus* was very common in this neighbourhood last year, and I noticed a curious habit of the imago which I have not observed in other butterflies. The insect, while sitting on a leaf or flower, will move the lower wings—not spreading them out as in flight, but vertically up and down, like a lever works. I believe I have seen both male and female moving the lower wings in this manner.—ALFRED SICH; 65, Barrowgate Road, Chiswick, Jan. 6th, 1902.

ACHERONTIA ATROPOS IN WESTMORELAND.—This species has been again present in our district during the year 1901, upwards of a dozen larvæ and pupæ having been found in different parts, and four of these have fallen to my lot. No. 1 pupated Aug. 20th; emerged Oct. 6th. No. 2 pupated Sept. 21st; emerged Nov. 19th. No. 3 pupated Sept. 21st; not yet emerged. No. 4 (pupa) put to force Nov. 23rd; emerged Jan. 10th, 1902. The first three were received as unearthed larvæ, and turned almost immediately. Ten days after pupation they were laid on dry soil, and put to force in an absolutely dry atmosphere of seventy to eighty degrees, not allowed even atmospheric moisture,

which hitherto I have considered a necessity. Nos. 1 and 2 would have emerged, I believe, without forcing, only a little later than the dates given. No. 4 changed to a dark colour on Dec. 20th, and as it lost weight considerably, I believed it to be dying. It proved, however, to be a case of slow development, for on Jan. 10th this year, a fine moth emerged. No. 3 is still healthy, but unchanged in colour. Both these latter would, I suppose, in a natural way, have "gone over" till June this year. The experiment of keeping the pupæ dry during forcing, although as yet not sufficiently extensive to be regarded as conclusive, still leads me to think that with this species a system of forcing, allowing absolute dryness or at most slight atmospheric moisture, offers the best prospect of success. There is no doubt that specimens which naturally would emerge the same year will often do so in spite of excessive moisture, but there is a risk, I think, in applying this treatment to pupæ which would ordinarily "lie over," and in the case of the former, if moisture is not really necessary to their successful emergence, there is little use being at the trouble of providing it.—FRANK LITTLEWOOD; Lynn Garth, Kendal, Westmoreland, Jan. 12th, 1902.

CHEROCAMPA CELERIO.—In April, ova, and larvæ in various stages of growth, were to be found freely upon a fleshy-leaved and spreading weed. I took a number of the larger larvæ, leaving any under an inch in length, and noticed, particularly in the larger specimens, small marks or scars upon their backs, and feared they were caused by parasites; however, they fed up and attained full growth, some spinning the pupal web, but not a single example changed; all sickened and died, and produced maggots of a rather large grey dipteran. A fresh lot of smaller larvæ was selected, care being taken that all with any discernible marks were rejected; still many proved to be stung, and several healthy pupæ only resulted. As the ova depositing continued during May, and even into June and July, I obtained as many of the moths as I desired, emergence taking place about three weeks after pupation, several having appeared this month. It may be mentioned that June and July are our coldest months; further, that this locality is in a dry belt of country, and that to find a hawk-moth in all its stages at such a time is very unusual, the early emergence being interesting from the fact that the weather is cold, and Lepidoptera can scarcely be met with. The most interesting point concerning *celerio* now in my possession is that fully half of the moths have emerged between eight a.m. and ten a.m., the others appearing during the evening, but they are very sluggish, and can safely be left all day or night, even longer. No doubt they would soon become lively if placed in the sun, the shade temperature here seldom being so low as seventy at midday. In Brisbane district *Sphinx casuarinæ* larvæ may be freely found in May and June, but the moths do not appear for several months. Altogether I examined scores, even hundreds, of *celerio* larvæ, but I failed to discover a single specimen of any size without the tell-tale parasitic marks.—F. P. DOBB; Warburton Street, Townsville, Queensland.

TWO NOTES ON *CYANIRIS ARGOLUS*.—On May 10th, 1901, I noticed a female of this species fluttering round a rhododendron in my garden

here, and on closer examination I saw her deposit an egg on one of the unexpanded flower-buds. This rhododendron, of which the flowers are white slightly flushed with pink, is named "purity." During the first week in July I beat some fifty *argiolus* larvæ off holly at Danbury. They were of all sizes. I had never obtained many wild larvæ of this species before, and was surprised to find how many produced ichneumons.—(Rev.) GILBERT H. RAYNOR; Hazeleigh Rectory, Maldon, Essex, Jan. 8th, 1902.

EMERGENCE OF MELANIPPE GALIATA IN DECEMBER.—In the autumn of last year I fed up a couple of batches of *M. galiata*, one of which pupated between Sept. 21st and 25th, and it was a surprise to me, on examining the cage in which they were kept, to find six freshly emerged imagines on the morning of Dec. 8th. The cage in which the larvæ were fed up, and in which the pupæ remained, had throughout the whole time been protected from rain and the direct sunshine, but otherwise fully exposed to the weather. The 8th was a particularly mild day, with a fresh south-west breeze, and warm rain-showers, the shade-temperature reaching 55 degrees, while the minimum of the preceding night had not fallen below 52 degrees.—ROBT. ADKIN; Lewisham, December, 1901.

THE ENTOMOLOGICAL CLUB.—A meeting of this ancient Club was held at the Holborn Restaurant on June 14th last, on the invitation of the host of the evening, Mr. G. H. Verrall. The reception was held in the Entomological Salon, and the guests and members of the Club commenced to arrive soon after 6.30 p.m. By 8 o'clock there was quite a large assemblage of notables in the entomological world. Several only paid a short visit, but nearly seventy sat down to a most *récherché* supper, which was served about 9 o'clock. Mr. Verrall, in proposing the toast of the evening—"The prosperity of the Entomological Club"—very properly embraced the opportunity afforded by the occasion to refer at some length to the ballot that was to take place in another place on the following evening. His remarks on this head were thoroughly impartial in character, but at the same time very much to the purpose. Further reference to the oration cannot be made, however, without infringing the privileges of a guest, or abusing the hospitality of the host.

The pleasure of the evening was again contributed to by Mr. M. Jacoby, who, accompanied by his son on the piano, enchanted the company by his delightful performance on the violin.

CAPTURES AND FIELD REPORTS.

NOTES FROM EAST SUFFOLK, 1901.—The list of insects appended below, and taken here during the last season, may possibly be of interest, a few of the species at any rate being, I believe, somewhat rare or local in this county. The earlier summer months were certainly very productive of insect life; but it has been a peculiar season, and I have been disappointed in the non-occurrence of many autumn insects; ivy, as far as my experience goes, has been very unremunerative.

Insects taken at sugar were as follows :—

Thyatira derasa, *T. batis*, *Cymatophora ocellaris*, *Acronycta psi*, *A. leporina* (one), *Leucania conigera*, *L. lithargyria*, *L. comma*, *L. impura*, *L. pallens* (four beautiful dark-red varieties), *Hydrécia nictitans* (some nice varieties), *H. micacea*, *Axylia putris*, *Xylophasia rurea*, *X. lithoxylea*, *X. polyodon*, *X. hepatica*, *Dipterygia pinastri*, *Neuria saponariæ* (abundant both at sugar and lilac bloom), *Cerigo cytherea*, *Mamestra abjecta*, *M. anceps* (abundant), *M. brassicæ*, *M. persicariæ*, *Apamea basilinea*, *A. gemina* (var. *remissa* and many nice forms), *A. fibrosa* (both varieties), *A. ceculea*, *Miana strigilis*, *M. fasciuncula*, *M. furuncula*, *Grammesia trilinea*, *Caradrina morphens*, *C. blanda*, *C. cubicularis*, *Rusina tenebrosa*, *Agrotis ralligera* (one), *A. puta*, *A. suffusa* (June brood), *A. segetum*, *A. exclamationis*, *A. corticea*, *A. nigricans*, *A. tritici*, *A. aquilina*, *Triphana ianthina*, *T. interjecta* (especially fond of sugared tansy), *T. orbona*, *T. pronuba*, *Noctua augur*, *N. plecta*, *N. c-nigrum*, *N. triangulum*, *N. rhomboidea* (one), *N. brunnea* (one), *N. festiva*, *N. rubi*, *N. umbrosa*, *N. xanthographa*, *Taniocampa gothica*, *T. instabilis*, *T. stabilis*, *T. munda*, *T. cruda*, *Orthosia lota*, *O. macilentia*, *Anchochelis pistacina*, *A. lunosa*, *A. litura*, *Cerastis racinii*, *C. spadicea*, *Scopelosoma satellitia*, *Xanthia gilrago*, *X. ferruginea*, *Cosmia trapezina*, *C. affinis*, *Hecatera serena* (one), *Miselia oxyacantha*, *Phlogophora meticulosa*, *Euplexia lucipara*, *Aplecta nebulosa*, *A. adrena* (very plentiful), *Hadena protea*, *H. dentina*, *H. chenopodii* (specimens kept appearing from the early part of June to quite the end of August), *H. suasa*, *H. oleracea*, *H. thalassina*, *H. geniste*, *Xylina rhizolita*, *Gonoptera libatrix*, *Amphipyra pyramidea*, *A. tragopogonis*, *Mania typica*, *M. maura*, *Catocala nupta*. A small number of *Geometræ* and *Micros* also appeared.

My illuminated moth-trap added a few species, but on the whole I did not find light very attractive, possibly because I did not hit upon the right place to set my trap. *Cerigo cytherea* seems to have a special penchant for light, more so than for sugar, and came in numbers; and, amongst others, I may mention *Nola confusalis*, *Lophopteryx camelina*, *Ulix glaucata*, *Characas graminis*, *Calamia lutosa*, *Epione apiciaria*, *Selenia lunaria*, *Odontopera bidentata*, *Himera pennaria*, *Acidalia bisetata*, *A. trigeminata* (this insect also comes freely to sugar), *A. rubiginata* (rubricata), *A. emarginata*, *A. promutata*, &c. From reed-beds at dusk, in addition to some of the *Leucaniidæ* already noted, *Leucania straminea* (a few), *Calamia phragmitidis* (in some plenty), *Nonagria neurica* (one), together with examples of *Chilo phragmitellus*, were secured. The reed-beds were only worked at dusk, three rather windy nights during the second week in August. *Aspilates citraria* was plentiful in a clover-field, and many other *Geometræ* were met with on the wing at dusk. I took a few *Micros*, but was unable to devote much time to them. *Sphinx convolvuli* appeared on August 15th, and September brought quite an army of them, but for the most part in bad condition, until the first week in October, when there seemed to be a fresh emergence and I took five or six perfect specimens. My experience in this respect seems to tally with that of Mr. J. H. Fowler (*vide* Entom. Nov. 1901, p. 321). Larvæ and pupæ of *Acherontia atropos* have not been uncommon. All the *Noctuæ* mentioned as taken at sugar occurred within a very small area, comprising some two and a half acres of cultivated garden-land and pasture, with a

small copse, mainly composed of oak, ash and elm, adjoining, and situated about a quarter of a mile or less from some salt marshes bordering the river Deben.

I would like to remark upon the attractions of lilac and arbutus. The former was a great bait for *Neuria saponariæ* and *Dianthæcia cap-sincola*, not to speak of many others. The charms of arbutus, too, seem great. Happening to notice bees and wasps and other insects swarming around its blossoms by day, I suspected it might prove equally attractive to moths at night, and I was not deceived, for though I found only common species, the number of these afforded by a large shrub of arbutus in full bloom compared very favourably with what I saw on the same nights at ivy, the latter being also fully out in the near vicinity. I may add, sugared flowers upon many occasions added to the bag, when tree-trunks and posts were entirely unproductive. (Rev.) A. P. WALLER; Hemley Rectory, Woodbridge, Nov. 21st, 1901.

LEPIDOPTERA AT WITHERSLACK.—Two days, July 7th and 8th, on the well-known Witherslack Mosses proved very successful. A very fine and long series of *Hyria auroraria* (all of the dark purple form) were secured; one or two worn females laid a small batch of ova, and I have succeeded in rearing half a dozen moths; these emerged on January 2nd this year. *Nemeophila russula* was also exceptionally abundant, a grand lot of females being taken; I obtained a quantity of ova of this species also, and was successful in rearing a very complete second brood, not more than three out of about sixty-six refusing to feed up, thirty-three females and twenty-seven males being bred the last week in September. *Canonympha davis* was over, only a few worn ones being seen. *Acidalia fumata* was also over, although a few nice females were secured, after much picking. *Eupithecia nanata* was fairly common and in fine condition; whilst *Lasiocampa (Bombyx) quercus* dashed about at a terrific pace. *Lycæna ægon* males were in evidence, but no females were observed.—C. F. JOHNSON; Brennington Crescent, Stockport, Jan. 22nd, 1902.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—December 6th, 1901.—The Rev. Canon Fowler, M.A., F.L.S., President, in the chair.—Mr. Frederick E. S. Adair, Flixton Hall, Bungay; Mr. William Anning, Box Hill, Surrey, and 39, Lime Street, London, E.C.; Mr. Edward Connold, 7, Magdalen Terrace, St. Leonards-on-Sea; Mr. Frederick Muir, 86, Christchurch Street, Ipswich; Mr. R. Shelford, The Museum, Sarawak, Borneo; and Mr. John Waddington, 38, Leicester Grove, Blackman Lane, Leeds, were elected Fellows of the Society.—Mr. J. H. Carpenter exhibited a number of *Colias hyale* bred from ova laid by the parent butterfly taken at Sheerness, August 18th, 1900. Mr. J. W. Tutt said that twelve months ago there was no reliable evidence as to the stage in which *hyale* passed the winter, but that Mr. Carpenter had proved that it hibernates in the larval state, and pupates and emerges in the spring. No one has yet successfully bred *C. edusa* through the winter, as they do not and cannot feed up these in this country. *Hyale*, on the other hand, is perfectly quiescent

during the winter months (October 20th to February 3rd, according to Mr. Carpenter's observation), and nothing would induce the larvæ to feed at that period even when subjected to a temperature of between 60° and 70° Fahrenheit. In the South of Europe and in North Africa both species emerge normally in May or earlier, and the larvæ attempt in Great Britain to follow out their natural habit, with the result that the great majority must perish, especially in the case of *C. edusa*. The complete life history has been most accurately described by Mr. F. W. Frohawk in the 'Entomologist' for June, 1901.—Mr. R. S. Standen exhibited specimens of *Lycæna dolus*, the type from Bordighera, and also *Pieris brassica* with greenish under wings, a common form in the neighbourhood of Florence. Mr. C. P. Pickett exhibited pupa-cases of *Saturnia paronia*, one with two openings, one with no openings, and a third containing three pupæ, from only one of which the imago had emerged. Mr. J. W. Tutt said that this phenomenon was not unusual in the case of silkworms, and commonly occurred also in the case of artificially bred *Lasiocampa lanestræ*, being probably due to overcrowding, but he did not know that there was any evidence how the work was done.—The Rev. A. E. Eaton exhibited adult *Psychodidæ* of morphological interest, preserved in cork tubes with two per cent. formic aldehyde in distilled water.—(1) *Pericoma notabilis*, Etn., as a sample of male flies retaining prothoracic air nipples, such as Curtis figured (Brit. Ent. xvi. 745, 1839), and are possessed by pupæ of both sexes, illustrated both by Mial and Walker and by Fritz Müller in the volume of the 'Transactions' of this Society for 1895; also by Kellogg, Ent. News, xii. 48, figs. A, B. (Feb., 1901). *Pericoma soleata*, Hal. MS., has similar small claviform air-nipples on the prothorax; and so have some undescribed species more nearly related to *P. notabilis*, natives of Middle Europe or of Algeria. (2) Male flies possessing erectile sacs, or else protrusible tentacles arising one on each side of the mesothorax near the spiracle, and receiving a strong branch from the main trachea of each side. In the state of contraction these sacs or tentacles resemble a tuft of hair which is very dense in some flies; by their distension, the tufts are either spread open, or the tuft is resolved into scattered hairs distributed over at least the whole of the upper surface of the tentacle. These organs are probably subservient to sexual attraction, and perhaps secrete scent. A few males possess them in addition to the pair of prothoracic air-nipples—for instance *P. fusca* and the species figured by Curtis, *P. auriculata* (both exhibited); but more species are possessors of the meso-pleural pair of appendages alone. The two species last named differ in the shape of their thoracic appendages now under consideration: the male *P. fusca* has short, chitinous, slightly curved prothoracic air-nipples, and short nipple-like meso-pleural appendages that spread a dense epaulet-like tuft of hair; while *P. auriculata* has slender club-shaped whitish prothoracic air-nipples, and meso-pleural tentacles that are clad with silky hair and are capable of great extension. But in the majority of species furnished with this kind of tracheate appendages issuing from the meso-thorax, those of the prothorax are absent; and some have appendages of the sac form, others of the tentacular form. Among the exhibits, *Ulomyia fuliginosa*, *Pericoma nubila* and *trivialis* are exponents of the short

nipple-like, erectile, sac-shaped meso-pleural type of appendage seen in *P. fusca*; while *Pericoma palustris*, *mutua* and the nameless species from the Schwarzwald, together with *P. cognata*, which was not exhibited, have the tentacular type of meso-pleural appendage seen in *P. auriculata*. Mr. H. St. J. Donisthorpe read a paper entitled "The Life-history of *Clythra quadripunctata*," and Mr. G. W. Kirkaldy communicated "A Memoir upon the Rhynchotal Family *Capsidæ*."—H. ROWLAND BROWN, M.A., *Hon. Sec.*

Jan. 15th, 69th Annual Meeting.—The Rev. Canon Fowler, M.A., F.L.S., President, in the chair.—After an abstract of the Treasurer's accounts, showing a large balance in the Society's favour, had been read by Colonel Yerbury, R.A., one of the Auditors, Mr. H. Goss, one of the Secretaries, read the Report of the Council. It was then announced that the following had been elected Officers and Council for the Session 1902–1903:—President, the Rev. Canon Fowler, M.A., F.L.S.; Treasurer, Mr. Robert McLachlan, F.R.S.; Secretaries, Mr. Herbert Goss, F.L.S., and Mr. Henry Rowland-Brown, M.A.; Librarian, Mr. George C. Champion, F.Z.S.; and as other Members of Council, Mr. R. Adkin, Professor T. Hudson Beare, F.R.S.E.; Mr. Arthur J. Chitty, M.A.; Mr. W. L. Distant, Mr. F. DuCane Godman, D.C.L.; F.R.S.; the Rev. Francis D. Morice, M.A.; Professor E. B. Poulton, D.Sc., F.R.S.; Mr. Edward Saunders, F.L.S.; Dr. David Sharp, M.A., F.R.S.; and Colonel C. Swinhoe, M.A., F.L.S. The President announced that he should appoint Dr. F. DuCane Godman, F.R.S., Professor E. B. Poulton, F.R.S.; and Dr. D. Sharp, F.R.S., as Vice-Presidents for the Session 1902–1903. The President referred to the losses the Society had sustained during the past Session by the deaths of Mr. C. E. Collins; the Rev. Professor William P. Dickson, D.D.; Dr. H. W. Livett, M.D.; Mr. Lionel de Nicéville, F.L.S.; Miss Eleanor Ormerod, LL.D.; and Mr. H. Vivian, M.A. He then delivered an Address, in which he dwelt chiefly with the question of protective resemblance and mimicry in the case of the Coleoptera. At the conclusion of the Address a vote of thanks to the President was proposed by Professor Poulton, seconded by Professor Meldola, and carried. A vote of thanks to the other officers was then proposed by Colonel Swinhoe, seconded by Mr. Distant, and carried. Canon Fowler, Mr. Goss, and Mr. Rowland-Brown replied, and the proceedings terminated.—H. Goss and H. ROWLAND-BROWN, *Hon. Secs.*

SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—*November 28th, 1901.*—Mr. W. J. Lucas, B.A., F.E.S., Vice-President, in the chair. The evening was set apart for a special exhibition of varieties and notable captures. A considerable number of members and friends attended, and a large number of specimens were exhibited.—Mr. Carpenter exhibited a long and fine bred series of *Colias hyale*, from ova laid by a female from Sheerness, taken Aug. 18th, 1900.—Mr. Lucas, male and female of the rare British dragonfly *Libellula fulva*, taken near Bournemouth by Major Robertson; male *Oxygastra curtisii* from the same district; and male, female, and female var. *aurantiaca* of *Ischnura elegans*, from the New Forest. He also showed two large and perfect bubble-shells, *Haminea hydatis*, from South Devon, with a curious thickened and eroded specimen of *Anodonta anatina*, from the

New Forest.—Mr. Ashdown, extreme variations in size of the following Coleoptera :—*Clytus arietis*, *C. mysticus*, *Molochus minor*, and *Pachyta cerambyciformis*.—Mr. West, a species of Homoptera, *Stictocoris flaveolus*, new to the British list, and taken by himself near Blackheath, in August and September, 1901.—Mr. Thornthwaite, a dark *Hybernia defoliaria*, taken by him on his way to the meeting.—Mr. W. J. Kaye, a beautiful series of *Ambulyx rostralis*, a South and Central American Spingid, with specimens of var. *ganascus*, which some consider a species. Also he showed a single specimen of a new species of *Ambulyx*, which he taken during the past summer, while on an expedition to the interior of British Guiana.—Messrs. Harrison and Main, varied series of (1) *Triphæna comes* from various localities, including the Isle of Lewis; (2) *Agrotis tritici* from Isle of Lewis and Wallasey; (3) *Odontopera bidentata*; (4) *Camptogramma bilineata*; and (5) *Melanippe sociata*, all from the Isle of Lewis.—Mr. R. Adkin, several of the same species from the Isle of Lewis, with *Noctua xanthographa*, particularly fine and varied *Boarmia repandata*, *Coremia ferrugata*, and *Xylophasia monoglypha*. He also showed an example of *Pieris daphidice*, with *Colias hyale* and *C. edusa*, taken at Eastbourne, 1901.—Mr. Montgomery, a very fine bred series of *Pieris napi*, including a number of fine examples of var. *bryonia*, from ova laid by a female taken by Mr. Harrison at Meyringen, July 9th, 1900; a series of bred *Leucophasia sinapis*, consisting of four broods from females sent alive to him from Malvern; and bred series of *Argynnis paphia* and var. *valezina* from New Forest ova.—Mr. Porritt, black forms of *Pharetra menyanthidis* from Selby; *Mania typica*, with a large pale pinkish V-shaped mark across each wing; *Cosmia trapezina*, with central band dark olive-green; black *Larentia multistrigaria*; a yellow *Anchocelis rufina*; and a black *Odontopera bidentata*; all from Yorkshire.—Mr. Garrett, *Sphinx convolvuli* from Wilts, September, 1901; *Miselia oxyacanthæ* and var. *capucina* from Wimbledon; *Epunda lutulenta* taken off ripe blackberries at Reading; *Dasycampa rubiginea* from Berkshire; and *Tenio-campa populeti* from Wimbledon Common.—Mr. Chittenden, *Lithosia sericea*; var. *confluens* of *Anthrocera trifolii*; black *Nyssia hispidaria*; *Zonosoma pendularia*, blue from Lancashire, light from Kent; *Cymatophora duplaris*, black, bred, from Kent; dark *Pachetra leucophæa*; dark *Hybernia marginaria*, Kent; &c.—Mr. Brown (G. B.), a specimen of *Euvanessa antiopa* taken by his little boy at Lee, together with a *Sphinx convolvuli* taken at Lydd, the former on Aug. 24th, and the latter on Sept. 14th.—Major Ficklin, two very pale *Dianthæcia luteago* var. *ficklini*, and one with suffused marking; together with an example of *Brenthis selene* with very dark under wings.—Mr. Stanley Edwards, several species of the "leaf" butterflies, *Kallima*, and a box of exotic *Papilios*.—Dr. Chapman, *Pieris brassicæ* with black marginal line on hind wing; *Argynnis adippe* var. *chlorodippe* with black suffusion; and a dark variety of *Melitæa athalia* from Spain.—Mr. Rowland-Brown, series of *Lycæna dolus* var. *vittata* from Cannes, and *L. admetus* var. *rippertii* for comparison; a var. of *Melitæa cinxia* with the black spots on the under side almost absent; and *Argynnis lathonia* with the left lower wing abnormally small.—Mr. Sich, small dark var. of *Aglais urticæ*; two varieties of *Xylophasia polyodon*, one having a dark median band, the other with confluent

stigmata; a *Plusia gamma* having the γ mark reduced to a pale spot.

December 12th.—Mr. W. J. Lucas, Vice-President, in the chair.—Mr. Newnham, Hersham, Surrey, was elected a member.—Mr. MacArthur exhibited a male specimen of *Lasiocampa quercus* taken at Brighton, and having the female coloration.—Mr. Kirkaldy, a specimen of the Heteropteron *Reduviolus fesus*?, having the wings on one side brachypterous and on the other macropterous.—Mr. F. M. B. Carr, a bred series of *Selenia illunaria*, compared with the female parents, and showing considerable variation; series of *Ennomos angularia* from several localities, for comparison; *Dicycla oo* from Chingford; varied series of *Bryophila muralis* from Hythe; and series of *Acidalia marginipunctata* from Hythe and Porlock, the latter being much the darker.—Dr. Chapman read a paper entitled, "A few weeks in Central Spain, and exhibited long and varied series of the Spanish forms of British Lepidoptera, and of species very closely related to British species.—H. J. TURNER (*Hon. Report Secy.*).

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.—The monthly meeting was held on Dec. 9th, 1901, in the Grosvenor Museum, Chester, where the members were most cordially received by the Curator, Mr. Robert Newstead, and Dr. H. Dobie. The Vice-President, Mr. R. Wilding, occupied the chair.—The chairman, on behalf of the Society, thanked Mr. Newstead for his handsome donation to the library of a copy of the first volume of his work on the scale insects entitled, 'A Monograph of the British Coccidæ.' This valuable contribution to the science of entomology has been published by the Ray Society, and contains thirty-nine plates from original drawings by the author. The work, purely a labour of love, is not only of great interest to the entomologist as being the first monograph of these injurious insects ever published in this country, but is also of great practical value to the fruit-grower; and it would be well if a copy of it could be placed in the hands of every market-gardener and horticulturist throughout the land.—The following exhibits were examined:—Recent specimens of *Lycana arion*, and Welsh specimens of *Saturnia pavonia*, by Mr. Newstead; British Aphodiina, including *A. villosus* and *Ægialia rufa*, by Mr. Wilding; *Trigonogenius globulus*, a Coleopteron new to the Cheshire list, on behalf of Mr. E. J. Burgess-Sopp; rare Aculeate Hymenoptera from Cheshire and North Wales, including *Pompilus approximatus*, *Astata stigma*, *Oxybelus mucronatus*, *Vespa austriaca*, *Colletes cunicularia*, *Halictus atricornis*, *Osmia xanthomelana* *O. inermis*, and *O. parietina*, by Mr. Willoughby Gardner; the exceedingly rare *Ophiodes lunaris*, taken in Delamere Forest by Mr. T. Wright, of Warrington (an account of this capture, establishing its genuineness beyond all doubt, was given by Mr. Joseph Collins, along with a summary of all the previous British records); a fine series of Lepidoptera from Simonswood Moss, including *Carsia imbutata* and *Celæna parvorthii*, by Dr. J. Cotton.—Mr. Newstead read a paper entitled 'Entomological Gleanings from my Diary,' which was illustrated by electric light views. As usual, it was exceedingly instructive, almost every sentence containing some new observation or fact in insect economy, so that this most wide-awake of naturalists kept his hearers

on the alert all the time. The paper included the following subjects:—A night in Delamere with an electric arc lamp; the occurrence of *Zeuzera ceculi* in Cheshire; the assembling of *Saturnia paronia*; jays and the larvæ of *Geometra papilionaria*; the genus *Sesia* in Delamere; *Tipula oleracea* and its ravages—how the rooks and gulls destroy it by thousands, four hundred being found in a single pellet or casting of the black-headed gull; the life-history of *Selandria atra*, or pear-tree sawfly; and recent researches amongst the scale insects. Hearty thanks were offered to Mr. Newstead by Mr. R. Wilding, Dr. J. W. Ellis, and Mr. W. Gardner.—FREDERICK BIRCH, *Hon. Secretary*.

BIRMINGHAM ENTOMOLOGICAL SOCIETY.—November 18th, 1901.—Mr. A. H. Martineau in the chair. Dr. Stacey Wilson and Mr. E. A. Laxar were elected members of the Society.—Mr. Wainwright exhibited the Tachinid *Brachychata spinigera* from near Hampton-in-Arden, and said that this was the species which had been described by Meade as *Desroidea fusca*, and not *Staurochæta gracilis*, as supposed by Brauer and Von Berganstamm.—Mr. P. W. Wynn, a number of Lepidoptera taken by himself in South Devonshire, during the last week of August and first of September this year; amongst others were *Lithosia caniola*, three worn specimens; *Leucania albipuncta*, one only; *Caradrina exigua*, two only; *C. ambigua*, a nice long series in very fine condition; *Heliothis armigera*, worn; *Aspilates ochrearia (citraria)*, a nice long series; *Acidalia subsericeata*; and a very fine long series of *A. marginepunctata*.—Mr. A. D. Finns, mounted preparations and drawings of marine larvæ which he believed to belong to the genus *Clunio*, and which were taken submerged in rock-pools at Port Erin Bay, Isle of Man.—Mr. J. T. Fountain, Lepidoptera from Jersey:—a series of *Callimorpha quadripunctaria (hera)*, including forms running into yellow; a long and very variable series of *Bryophila muralis*, and a very fine series of *Psecadia bipunctella*; the last species, he said, was found early in the morning, and the earlier they were looked for, the more there were, most being found at six a.m.—Mr. R. C. Bradley, a series of *Pelecocera tricineta* from Bournemouth, taken this summer; this time he found them on the top of the cliffs, not in the hollows of the chines as before.—COLBRAN J. WAINWRIGHT, *Hon. Sec.*

RECENT LITERATURE.

Photography for Naturalists. By DOUGLAS ENGLISH. Illustrated by the Author's photographs from the living objects. London: Iliffe and Sons, Limited. 1901.

Present-day biologists have a great advantage over their predecessors in that they have a ready means of recording facts in connection with animal life other than by drawing, painting, or verbal description. To the brothers Kearton, perhaps, we owe chiefly the popularizing of the camera in field natural history, and in Mr. English's book we are reminded of the work of the better known writers just mentioned. In addition to general information on

methods, aims, apparatus, and materials, there are chapters specially devoted to various groups of animals, though the information given under these various headings often seems to be of general application. Most of the somewhat numerous illustrations we like very much,



LUCANUS CERVUS. (From 'Photography for Naturalists.')

the small mammals, reptiles, and fish being in most cases particularly pleasing. Entomologists no doubt would have forgiven the author if he had devoted more than one chapter to their *special* branch, but that, of course, was out of the question, and, indeed, unnecessary, since throughout the book are given so many hints on means and methods of securing desired results. Perhaps it is hardly worth mentioning



VANESSA ATALANTA. (From 'Photography for Naturalists.')

that we notice the word "variety" used more than once where "species" is clearly intended; and that we fail to see where the "birds" will fall in the scheme of Nature if they are not to be classed amongst the "animals" (p. 27). Mr. English is clearly writing about what he has himself practised, and we heartily recommend his work to the favourable notice of the "Naturalist with a Camera."

Two illustrations in the book are here reproduced by permission of the publishers.

W. J. LUCAS.

W. F. DE VISMES KANE.—*A Catalogue of the Lepidoptera of Ireland*. Reprinted, with an Introduction, from the 'Entomologist.' 1901. West, Newman & Co. xviii, viii, and 166 pp.; and a coloured Plate.

THE readers of the 'Entomologist' will already be familiar with the main portion of this useful work, which has been running serially for some years through the pages of the 'Entomologist,' and now republished in a complete and handy form, prefaced by a discussion upon the origin of the distribution of the Irish Lepidopterous Fauna.

From the collector's standpoint, Ireland is not offered as an attractive field, for not only does the climate interfere with continuous work, but Lepidoptera in most districts are actually scarce. This is due to, "firstly, the very large area of country with a heavy and tenacious soil, which retains and becomes sodden with wet. Secondly, by the 'insular climate,' with constant rainfall and but little frost throughout the autumn, winter, and spring; . . . while the summers are characterized by the want of sunlight and heat." The absence of the great banks and hedgerows of England—due to ancient and settled agriculture—the absence of any great districts of primæval forest-lands, or of fen districts, &c., are other causes of this scarcity. Where the opposite conditions prevail, are the most productive hunting-grounds, as also the extensive bogs, and the long coast-line with sand-dunes. "In such situations no disappointment will be felt by the most greedy collector."

Ireland is held out, however, as "unrivalled in Europe in respect of isolation of geological history," and it is for the purpose of elucidating the numerous problems connected with the origins of the geographical distribution of the Insecta that scientific collectors are so much needed in Ireland. Even in England, the only orders of whose local distribution there is extended information are Lepidoptera and Coleoptera; while in Ireland, Scotland, and Wales there are huge tracts entomologically unknown. In Scotland a few "show places"—as, for example, Rannoch—are visited year after year for the same rarities, while the lonely glens of Ross and the wild moors of the Hebrides remain silent. In Ireland it is almost incredible that the Lepidoptera are a "neglected order," but now that Mr. Kane has provided a sound Introduction, based upon many years of patient research, it remains for the many enthusiastic and experienced English collectors to combine an inexpensive and health-giving holiday amid magnificent scenery with opportunities for entomological work of an enduring value.

The origin of the Palæarctic Insect fauna is an extremely difficult matter to discuss briefly. In the first place, the leading authorities are widely divergent as to their opinions on climatic conditions at certain important periods; and, secondly, even were this not so, it is very doubtful whether the methods of dispersal adopted by the Insecta are at all comparable with those employed by *e.g.* the Mammalia. As the principal arguments of writers are in general based upon their studies of Vertebrates, Plants, and, to some extent, Mollusca, we may, in following these authorities, be founding our speculations on an erroneous basis. Students of the Vertebrata, moreover, are enormously aided by fossil remains, which in the Insecta are so seldom found, and when found are so rarely in sufficiently good preservation for the obtaining of more than very general inferences as to their systematic position, that they may safely be disregarded in detailed work.

It is usually admitted that in the earlier periods of the Tertiary Epoch—the epoch in which we are now actually living, though it was formerly the fashion to isolate ourselves in a “Quaternary Epoch”—the climate and configuration of Western Europe were very different to their present condition. The former was semi-tropical, while the Continent had a notable extension westwards, there being solid land, broadly speaking, from North Scandinavia to Spain, including the British Isles. Till recently it was very generally held that a “Glacial Period” or “Ice Age” ensued, which was of such a rigorous nature that all life was blotted out over almost the whole of Europe. This is the view held, for instance, by Buchanan White,* E. Hofman,† and W. Petersen.‡ R. F. Scharff, on the contrary,§ maintains an almost diametrically opposite view, the crux of his position being “that the glacial period in Europe was not a time of extreme cold, and that its destructive effect on the animals and plants was by no means such as is currently reported”; in fact, that the climate was not very different from what obtains now, but moister, with warmer winters and cooler summers. Scharff has been criticized at great length by L. Stejneger,|| who holds an intermediate position, and considers that the Ice Age in Europe was similar in climate to that now obtaining in Greenland and the islands north of Hudson’s Bay.¶ It is therefore obvious that the presence or absence, at the present day, of “pre-glacial” faunas in the British Islands, and in Ireland especially, is far from being an established fact. Buchanan White considered that Britain derived the whole of “its butterfly fauna from Continental Europe in post-glacial times,” a natural sequence to his belief of the rigour of the glacial climate. It is remarkable, however, that at the commencement of the Ice Age a large portion of the western continent was submerged, and Ireland was cut off from Spain, but was nevertheless prolonged southwards considerably beyond its present limits. It is considered possible that this south-western extension—now submerged—was the refuge of the pre-glacial semi-tropical British “Biota” (as Stejneger terms the “Fauna” and “Flora”). The presence in Ireland of such forms as the spotted slug (*Geomalacus maculosus*), and the strawberry-tree (*Arbutus unedo*), can scarcely be otherwise explained, although Kane seems to favour a post-glacial bridge between South Ireland and the west coast of France. It is doubtful, however, whether any Insects can be pointed out with any degree of certainty as pre-glacial relics, and there is always the risk of confounding these with comparatively recent importations due to the formerly not inconsiderable commerce between the Peninsula and Ireland. Among these “relics” may possibly be the little moth *Zelleria phillyrella*, a native of Southern France, Italy,

* “Some thoughts on the distribution of the British Butterflies,” 1881, ‘Entomologist,’ xiv. pp. 265–77.

† “Die Isoporien der Europ. Tagfalter,” 1873, Inaugural Dissert. Philos. Fakultät, Jena.

‡ “Die Lepidopt. Fauna d. arktisch. Gebiete v. Europa,” 1888, Beitr. Kenntn. Russ. Reichs iv.

§ ‘History of the European Fauna,’ London, 1899, vii and 364 pp., 21 figs.

|| Scharff’s “History of the Europ. Fauna,” 1901, American Nat. xxxv. p. 87, et seqq.

¶ In connection with this Stejneger notes that a humming-bird occurs as far North as Sitka, almost within sight of the gigantic glaciers.

and Greece, and recently discovered in Connemara, but not found elsewhere in Britain. The weevil *Otiorrhynchus auropunctatus* occurs also in Ireland, but not elsewhere north of the Auvergne Mountains.

Stejneger considers that some pre-glacial forms (such as *Geomalacus*) may well have survived the Glacial Period in sheltered nooks, and adds:—"We see even to-day isolated spots having a southern temperature within the limits of countries with a northern climate, and, on the other hand, similar northern oases in regions bounded by isotherms indicating a southern climate."

Stejneger also contends that too much reliance must not be placed on an admixture of northern and southern forms, as to conditions of climate. It is well known that the tiger, usually regarded as a tropical animal, hunts the wild reindeer in Manchuria, in a district having an annual temperature of between 0° and -2° C.

Since the climax of the Glacial Period, whatever may have been the amount of rigour then endured, the cold has gradually diminished, and our islands have been gradually restocked from the Continent. There is little agreement as to periods at which this influx occurred, and these matters cannot possibly be discussed within the limits of this notice. Suffice it to say that the greater part probably took place when the isles (or rather Great Britain only) were joined to the Continent by France and by Scandinavia, although of course there was much topographical shifting during the periods in question. Ireland was cut off at probably a very early date, and it is to this in great part that the meagre Irish fauna is due. Kane, however, insists upon the misleading character of a survey of the extant species, based solely upon geological history, without considering the characteristics of the organisms, and their capabilities of adaptation to environment. He regards the restriction of distribution in many of the Irish Lepidoptera as due to a similar restriction of the food-plant. *Rhodocera* (*Gonepteryx*) *rhamni*, e.g., is apparently restricted, in Ireland, to the "localities affording a sufficient abundance of *Rhamnus*, and not by climatic conditions; *Carsia paludata* is similarly dependent upon its local food-plant," *Vaccinium oxycoccos*. *Larentia flavicinctana* has hitherto only been noted—and that recently—from Ballycastle, but its search is recommended on its food-plant, *Saxifraga hypnoides*, along the Antrim, Sligo, and Clare coast-line. The notable absence of many English fen-haunting species from the Irish loughs, where *Arundo*, *Typha*, and various *Carices* are plentiful, is explained by the supposition that these insects "reached England from Holland, and, not finding suitable conditions west of Cambridge, did not spread further."

One of the most remarkable and inexplicable failures in the Irish fauna is the lepidopteron *Vanessa cardui*, which establishes itself either partially or wholly, with difficulty. As the "Painted Lady" is cosmopolitan, having penetrated to New Zealand, and even to the Hawaiian group, it is not easy to account for this instability by a reference to the "insular" climate of Ireland.

The impression gained from a study of the facts in their widest application leads only to the opinion that it is possible to say very little definite at present—as regards the Insecta, at least—and this is strengthened by close examination of the speculations advanced by White, Scharff, Stejneger, and Kane, in the works cited.

G. W. K.

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FORMATION OF PATTERN ON EGGSHELL OF A SPECIES OF LEPIDOPTERA.

BY AMBROSE QUAIL, F.E.S.

MESSRS. DAWSON and WOODHEAD published* the results of some experiments with certain fats and waxes, showing that on cooling these form into shapes of a "crystalline" nature; melted beeswax forming into natural hexagons, the dimensions of which may be varied by the thickness of the wax, microscopical hexagons resulting when very thin.

Analogy between these naturally formed "crystalline" shapes of fats and waxes, and the sculpturing of the eggshell of lepidopterous ova suggests itself, and to this I refer in my paper on "Embryology," Part I. (Trans. N. Z. Institute, vol. xxxiii.). A recent examination which I made will no doubt be of interest, and so far as it goes justifies the analogy.

The ovum of *Melanchra* (*Mamestra*) *mutans* has very distinct sculpturing, probably not more so than other *Mamestra*, but the longitudinal ribs are strongly developed, the transverse lines being very fine, it is really only with high magnification it is seen that the fundamental pattern is a modified hexagon; at the micropylar area the pattern is definitely hexagonal. Theoretically, it might be suggested that the strong parallel ribs assist the ova to keep in position until deposited, but this does not appear to be so.

Within the abdomen of *Hepiali* the ova are connected by bread-like tissue, each ovum forming a definite part of long strings of ova, and are not easily separable. The ova of *M. mutans* are not so connected by tissue; in fact, I was unable to detect any such bearing definite relation to the ova, which are smooth, placed end on end, pressed flat against each other, so

* 'Natural Science,' vol. xv. p. 347.

forming continuous *rouleaux* of ova, from which any and each is easily separable. It is not easy to detect the exact process, but I am fully satisfied that the *rouleaux* of ova are bathed lengthwise by a fluid (fat?); so long as this continues the ova are smooth, but as the quantity of fluid diminishes the ova become exposed to the air, sculpturing forms thereon, when quite dry the ova have orthodox sculpture of deposited ova.

There is little doubt that the bathing of the ova with fluid continues until the act of deposition, and it seems certain that the pattern of the ovum is due to this fluid, as it dries on exposure to air, forming into "crystalline" shapes. The fact that a few ova remained smooth is in accord with this conclusion, since these were amongst the earliest exposed to the air on opening the abdomen, being thereby probably too suddenly deprived of the necessary fluid.

Palmerston, N., New Zealand: Dec. 3rd, 1901.

THE COCCID GENUS *AULACASPIS*.

By T. D. A. COCKERELL.

THE genus *Aulacaspis*, the type of which is *A. rosæ* (Bouché), was separated from *Diaspis* by the present writer in 1893. The generic characters were supposed to be the strongly tricarinate male scale, and the divergent median lobes of the female, serrate on their long inner margins. Mr. R. Newstead, in his 'Monograph of the Coccidæ of the British Isles,' just published by the Ray Society, argues that these characters are not of generic importance. Nevertheless, he accepts *Aulacaspis*, distinguishing it from *Diaspis* by the regular rows of dorsal glands in the abdomen of the female. This character, taken as generic, gives us a new classification of the species, and I have therefore attempted to see whether it could be applied satisfactorily to all the species of the world. After some study, I remained undecided whether or not to accept Mr. Newstead's proposed reform, until I observed that by segregating the species on the proposed basis *Diaspis* became an American genus, *Aulacaspis* an Old World one. The type of *Diaspis* is *D. calyptroides*, which lives on cacti, and is unquestionably of American origin. Other species of *Diaspis*, tested by Mr. Newstead's character, are *D. celtidis*, *arizonicus*, *townsendi*, *pharadendri*, *baccharidis*, and *australis*, all American. *D. carueli* was first found in Europe, and has been thought to be of European origin; I now believe it is American, as it is not uncommon in the United States, and it is significant that the British specimens were on an American

species of *Juniperus*. *Aulacaspis boisduvalii* v. *maculata*, Ckll., becomes *Diaspis boisduvalii* v. *maculata*. *Aulacaspis miranda*, Ckll., becomes *Diaspis miranda*. *Aulacaspis cattleyæ*, Ckll., becomes *Diaspis cattleyæ*. These three are all American. *Diaspis piricola*, Del Guercio, appears to be certainly palæarctic, yet it is not an *Aulacaspis*. But it has the club-shaped glands at the bases of the lobes, as in *Diaspidiotus*, and I think it is related thereto rather than to *Diaspis*. It may stand as *Epidiaspis piricola*, using in a generic sense the subgeneric name already applied to it. ('Suppt. Check-list of Coccidæ,' p. 398.) *Aulacaspis* will contain at least the following, all described or listed under *Diaspis* by authors:—

Aulacaspis rosæ (Bouché). Europe.

Aulacaspis fagrææ (Green). Ceylon. The male scale has no keel.

Aulacaspis pentagona (Targ.). Probably native of Japan or China.

Aulacaspis auranticolor (Ckll.). Japan. The first (caudad) row of dorsal glands consists of only eight, the second has hardly so many.

Aulacaspis persimilis (Ckll.). Mexico; but so close to *pentagona* that it is doubtless originally from the same region, and was taken to Mexico on cultivated plants. It is possibly only a variety of *pentagona*.

Aulacaspis loranthi (Green). Ceylon. Male scale tricarinate.

Aulacaspis crawii (Ckll.). China.

Aulacaspis crawii fulleri (Ckll.). South Africa.

Diaspis zamiae and *Poliaspis cycadis* are of unknown origin, having been found hitherto on cultivated plants only, mainly in hothouses. But, judging from their affinities as shown by the glands, it seems likely that the first came from tropical America, and the second from the tropics of the Old World, where it finds a reasonably close ally in *Aulacaspis fagrææ*.

I will add a word about Mr. Newstead's treatment of *Parlatoria*. I have regarded *P. pergandei* as a variety of *proteus*, but I must now agree with Mr. Newstead that it is a valid species. Further, I think *P. proteus* v. *crotonis* (of which Mr. Newstead gives a beautiful plate) is also a good species, to be called *Parlatoria crotonis* (Douglas).

East Las Vegas, New Mexico, U.S.A.:

Jan. 2nd, 1902.

A FEW NOTES ON SOME OF THE BUTTERFLIES OF SYRIA AND PALESTINE.

BY MARGARET E. FOUNTAINE, F.E.S.

THOUGH I spent four months (from April 5th to August 3rd) in these two countries during the past summer, my success entomologically was anything but unprecedented, possibly the many counter interests of the places I visited may in some degree account for this; but at the same time I cannot describe Syria or Palestine, with the exception of one or two favoured spots, as countries in which butterflies might be said to abound. This is, I think, easily accounted for by the excessive aridity and absolute bareness of most of the mountains, which I can only describe as treeless, shrubless, and flowerless wastes, with large rocks and stones strewn everywhere in profuse abundance, even in the narrow strips of cultivated ground, generally appropriated for the cultivation of wheat or barley; indeed, I have seen the furrows of a cornfield entirely composed of loose stones, no sign of earth being visible, but a scanty crop was struggling on towards a mean and miserable harvest notwithstanding. Yet it is in these cornfields, choked with weeds, that (as Mrs. Nicholl remarked) the butterflies often seek a refuge, and places that in Europe would be passed over as most unlikely to be productive of anything worth netting would be the very spots that in Syria one would make for in desperation as the only alternative to an absolutely barren wilderness.

However, in the month of April I had an excellent fortnight's collecting in the neighbourhood of Ain Zahalta (a village in the Lebanon), though the weather some days was not altogether desirable. The country round Beyrout, too, especially up the Nahr-el-Kelb, or Dog River, was on the whole far from disappointing. In May I visited Damascus; and at the end of that month I found myself at Baalbek, a place of immense archaeological interest, but where I did practically no collecting worth mentioning. From June 4th to June 11th I was at Bsherreh, collecting in the neighbourhood of the Cedars. And on June 26th I started from Damascus to take the overland route to Jerusalem on horseback, arriving on July 6th. The heat was terrific, but I managed to do a certain amount of collecting on the way, much to the annoyance of the mukâri, who finally ended in expressing his disapprobation by smashing my net to pieces, presumably by accident (?), but was greatly dismayed when, on being ordered by my courier to unload the baggage horse, another equally well-appointed net was produced from one of my valises, the which he was told that if, when consigned to his care, it should be either torn, lost, or broken, he should receive

no bakhshish at the end of the journey, needless to add that that net arrived at Jerusalem in a high state of preservation.

I will now proceed to describe consecutively the few species I did come across; though my list lacks several that were taken by Mrs. Nicholl in the same localities, and also often at about the same time of year in 1900, and contains very few that she did not take, though my stay in the country began rather earlier than hers, and extended several weeks later in the season. I shall not mention any of the commoner species one meets with everywhere unless I have any remarks to make upon them.

Thais cerisyi, B.—Abundant almost everywhere in Syria, from the sea-level to an elevation of some 4000 ft.; especially common at Ain Zahalta in April. In May, at Alèy, I found the larvæ feeding on a very large kind of *Aristolochia*, which I sent to a friend in Budapest, but unluckily they all died on the journey. I did not see a second brood of this butterfly.

Doritis apollinus, Hbst.—This insect was practically over when I got to Syria, even in the mountains in the middle of April; for, though in some places in the neighbourhood of Ain Zahalta it flew in great abundance, it was almost impossible to find one specimen that was not torn and rubbed. However, I collected a number of the larvæ, which I found in great quantities, full-grown, and rolled up in the leaves of the same large *Aristolochia*, so that in a few days they all pupated. I took some sixty or seventy of them, and could have gathered hundreds more had I wished to do so. The larva of this butterfly had been first pointed out to me by Prof. Day up the Dog River, near Beyrout, feeding on a different and smaller kind of this plant.*

Pieris mesentina, Cramer.—This butterfly was beginning to come out on the plains south of Nazareth the first week in July; but I only succeeded in catching one specimen. It is the strongest and most rapid flyer of any butterfly I have ever seen. On July 31st, at about 5 p.m., I saw several which I could easily have captured in the grounds of the American College at Beyrout, but unluckily, not having my net with me, I was unable to do so; and the following morning, towards midday, the chances of catching swallows on the wing with a butterfly-net could scarcely be less than was my chance at this hour of the day of netting one of these swift-flying *Pieris*. (Observation.—Should not be sought for till after five o'clock on a sunny afternoon.)

Anthocharis belemia var. *glauce*, Hüb.—An occasional much worn specimen down on the coast in April and the beginning of May.

* The first emergence took place on December 22nd; unluckily it was a cripple. Several have since come out, but as yet only three specimens have expanded properly; the rest were all more or less deformed. One specimen, after having remained for about twenty-four hours in exactly the same condition as when it left its chrysalis, all at once began to expand, till it was almost perfect, except for one of the hind wings. Is it usual for freshly-emerged insects to wait twenty-four hours before they make up their minds to develop?—M. E. F.

A. belia var. *ausonia*, Hüb.—Not common, either on the coast or in the mountains.

A. charltonia var. *penia*, Frey.—My experiences with this butterfly seem exactly to tally with those of Mrs. Nicholl and others. Never common, only occurring singly and at rare intervals; I took four specimens, some of which were rather worn, and saw a few besides, near Ain Zahalta, towards the end of April.

A. damone, Feisth.—Fresh and plentiful near Ain Zahalta in April; the females, too, were fairly common, but much less so than the males. Specimens I have seen from Greece were much larger and finer than the Syrian form.

Leucophasia duponcheli var. *astiva*, Stgr.—I took this variety on the Jebel-el-Arz (Cedar Mountain) early in June, not far below the summit of the pass (8000 ft.) upon which only a week previous I had ridden for a distance of several yards over some still unmelted snow. It was not rare, but difficult to catch, on account of the steepness of the mountain side over which it was flying.

Idmais fausta, Oliv.—Of the habits and life-history of this butterfly I received a very interesting description from Mrs. Day. It first appears on the wing at the very end of June or beginning of July, and from that time produces a succession of broods on till the end of September, when it entirely vanishes in all its stages, and Mrs. Day has hitherto been unable to determine whether it passes the winter, spring and early summer in the ova, larva, or pupa state, or even, possibly, as a hibernating butterfly; though I cannot but think, if this were the case, the warm, sunny days of April, May and June could not fail to tempt it from its winter retreat; and it never reappears till the period above stated when, curiously enough, eggs, caterpillars and butterflies are all to be found simultaneously. The first appearance of it during the past summer, observed by Mrs. Day, was the sight of a worn female laying eggs; this would lead one to lean towards the idea of hibernation in the perfect state. However, at about the same time I saw it myself, inland; first on June 28th, one specimen, fresh out, near Bányás, and others, for the most part also quite fresh, three days later, in an olive-garden near the supposed Cana of Galilee, evidently just emerged. I observed it more than once flying in the streets of Jerusalem, and when I returned to Beyrout on July 15th, "the salmon butterfly" was very much in evidence everywhere, I think I might say, in town and country. I also found eggs and larvæ in all stages, feeding in quantities upon the leaves of the caper-plant, which grows wild in these countries. Mrs. Day informed me that, whereas the eggs and caterpillars are always to be found like this from the very beginning of July, she has never been able to discover any during the earlier months of the year. I bred some forty or fifty specimens myself and, with the exception of one deformity, every pupa I had produced a perfect insect, the proportion of males and females being about equal, though the male flies in considerably greater abundance in the natural state. The period from ova to imago occupies only three weeks, or even less; the larvæ feed up with the greatest rapidity; and the pupa stage of these summer broods extends over a period of only a few days. Yet it is as a pupa that I should be most inclined to think it passes those mysterious inter-

mediate months, a problem, Mrs. Day tells me, she is determined to solve, and the solution of which will, I think, be most interesting.

Thecla ilicis var. *caudatula*, Z.—Taken near Ainêta, in the Lebanon, first week in June, on the slopes of a mountain more or less clothed with plantations of young Syrian oak-trees, where they were extremely plentiful, and all, as far as I could make out, belonging to the long-tailed aberration.

T. myrtale, Klug.—Fairly common in the neighbourhood of the Cedars early in June, but I only took one female, and not a very long series of males.

Thestor callimachus, Ev.—I took one perfect male specimen of this butterfly on May 13th, at Alêy. It was probably only just emerging, and a spell of dull cold weather would account for my seeing no more of it before I left Alêy, two days later.

Polyommatus thersamon var. *omphale*, Klug.—This is undoubtedly a summer variety; those I took in the spring were all normal, while all the males of the summer brood possessed tails quite as long, if not longer, than the ordinary female.

Cigaritis acamas, Klug. — Three bad specimens only, all near Beyrout in May, two of which were taken in the grounds of the American College; and I saw another in this same place early in August. Mrs. Day has not as yet been able to discover upon what plant this little *Cigaritis* lays its eggs.

(To be continued.)

NOTES ON THE DIVISION VELIARIA [RHYNCHOTA] (= SUBFAM. VELIDÆ, LETH. & SEV.).

By G. W. KIRKALDY, F.E.S.

(Concluded from Entom. xxxiv. p. 310.)

R. NIGRICANS (*Burm.*).

Velia nigricans, Burm. 1835, Handb. p. 213.

Burmeister's description is altogether inadequate, and the species has long been unknown to me. I now have a pair from Syria which are probably referable to it.

Elongate; first segment of antennæ two-thirds longer than second, second and fourth subequal, third one-sixth longer than fourth; third segment of intermediate tarsi very slightly longer than second. (Macropterous form: pronotum obtusely angulate, obsoletely carinate longitudinally.)

Blackish brown with yellowish pubescence; base of first segment of antennæ pallid. Femora shining black, base (coxæ, spines, except tips of latter, &c.) pallid; an interrupted pale line at apex of pronotum.

♂. Seventh segment above truncate apically, longer than sixth, and a trifle longer than the eighth.

Long. 4 mill.; lat. $1\frac{1}{2}$ mill.

Hab. SYRIA, Kaïfa (coll. Kirkaldy).

R. ANGUSTIPES, Uhler. Venezuela, Puerto Cabello (Mus. Hamburg!).

R. RAVANA, sp. nov.

Allied to *crassipes*, but the latter has the ultimate segment of the intermediate tarsi *slightly longer* than the second, the venter carinate, and the colouring different. *R. crassipes* is also larger.

Elongate. Antennæ: first segment one-half longer than the second, which is one-seventh longer than the third, which is one-fifth longer than the fourth; first scarcely longer than third and fourth together. Pronotum (*macropterus*) obtusely rounded; (*apterous*) widely rounded behind. Elytra rounded at apex, not reaching as far as the apex of the genital segments. Anterior tibiæ not dilated, ♂ ♀. Intermediate femora not constricted medianly; ultimate segment of tarsi two and two-thirds as long as penultimate. Posterior femora incrassate; tibiæ sinuous, without a hook at apex; ultimate segment of tarsi three and a half times as long as penultimate. Abdomen moderately long.

Brownish black; head (more or less), and a central longitudinal stripe on pronotum, ferruginous. Antennæ unicolorous (not widely pallid at base of first segment of antennæ). A large silvery patch near antero-lateral angle of pronotum. An elongate spot of base of corium, another in the central cell, and another nearer the apex of the elytra, silvery white; nervures very distinct. Femora more or less pallid, especially basally and beneath; coxæ and trochanters pallid. Connexivum with a broad median longitudinal pale flavous stripe. Venter dark brownish (very thickly dark yellowish pilose) more or less pallid medianly.

♂. Posterior femora two and two-third times as long as wide, three moderate-sized and several small spines beneath; tibiæ strongly sinuous, tuberculo-spinose beneath; seventh abdominal segment beneath, long laterally emarginate, medianly subtruncate, apically depressed; above, truncate apically.

♀. Posterior femora three and a half times as long as wide; spinose similarly to ♂; tibiæ slightly sinuous; seventh segment beneath slightly roundly emarginate.

Long. 4-4.6 mill.; lat. 1.9 mill.

Hab. CEYLON, Peradeniya (E. E. Green).

A LIST OF LEPIDOPTERA COLLECTED BY DR. CUTHBERT CHRISTY IN NIGERIA.

BY EMILY MARY SHARPE.

THE insects in this collection were all taken on the banks of the Niger, or within a few miles of the river, at various points between Lokoja and Ilo. Those from Lokoja were mostly captured on Mount Patti, which rises abruptly behind the town for about a thousand feet. It is thickly wooded, except on the top, which is flat, open, grass country. At a certain spot, used by the Imperial forces stationed at Lokoja as a flag-station and sanatorium for convalescent officers and men, are the remains of what may have been a small village, and round about this spot flourishes a profusion of flowers and plants, many of which seem to be peculiar to the locality. Here more butterflies were to be seen in an hour than could be seen in a month at any other place in Nigeria that I visited.

Lokoja is at the junction of the Benue River with the Niger, and is, roughly speaking, about 400 miles from the sea. Egga is about eighty miles above Lokoja, and Jebba, the head-quarters of the Imperial forces in Nigeria, is some 150 miles further up. Most of the insects from Jebba were collected about the island on which the town and Imperial camp are situated, or on Juju-rock Island. The Juju-rock, such a prominent feature in the landscape at Jebba, rises from the bed of the river to a height of 300 ft. or more. It is practically a sheer cliff on all sides, and was never explored till I succeeded, after three days' toil, in finding a way to the summit in May, 1898. It was up to that date the centre of much superstition and mystery, and was talked of with dread by the natives for hundreds of miles both up and down the river. Its summit is covered with scrub, amongst which I noted several plants I had not seen elsewhere. The same was the case with the butterflies, and two or three species which are specially mentioned in the following list I saw nowhere else. The flora and fauna of the Juju-rock at Jebba are peculiar in many ways, and would, I am sure, well repay anyone making them a special study.

Bajibo, Leaba, Bussa, Yelwa, and Gomba are places on or near the river bank between Jebba and Ilo, the most northerly station in British territory, and nearly a thousand miles from the river's mouth. At Ilo the country is very different to what it is lower down the river. It is less wooded, and large stretches of open country little more than desert are frequent. The people, too, are very different, being a much finer race, particularly the men, who wear the flowing robes and ornaments of the Arab. In this district, bordering upon the Western Soudan, the butterflies

are largely represented by the Pieridæ, especially by the genus *Teracolus*.

The Benue flows for most of its course through impenetrable jungle. The town, and Niger Company's station, of Mozum is about twenty miles from its junction with the Niger.—[C. C.]

Family DANAIDIDÆ.

1. *DANAIS ALCIPPUS* (*Cram.*).—*a*, ♀. Sierra Leone; February, 1898. *b-h*, ♂ ♀. Jebba, River Niger; September, October, 1898. *i, j*, ♂ ♀. Mount Patti, Lokoja; May, 1898. *k-p*, ♂ ♀. Ilo. *q, r*, ♂ ♀. Shonga; September, 1898.

"One of the commonest butterflies all the year round, frequenting the damp open parts near the river."—C. C.

2. *DANAIS PETIVERANA*, *Doubl. & Hewits.*—*a*, ♂. Jebba, Niger River; October, 1898.

"Only observed on one occasion, when a dozen or more appeared in October at one particular spot near the river. They were difficult to catch, owing to their quick movements and rapid flight."—C. C.

Family SATYRIDÆ.

3. *MELANITIS SOLANDRA* (*Fabr.*).—*a*, ♀. Jebba, Niger River; May, 1898.

4. *MYCALESIS MILYAS*, *Hewits.*—*a*, ♂. Jebba, Niger River; September, 1898.

5. *MYCALESIS DESOLATA*, *Butl.*—*a, b*, ♂. Jebba, Niger River; November, 1898.

In the collection at the British Museum three specimens of this species are recorded from the Atbara River and Abyssinia.

6. *MYCALESIS SAFITZA*, *Hewits.*—*a*, ♂. Jebba, Niger River; November, 1898. *b*, ♂. Mozum, Benue River; June, 1899.

7. *MYCALESIS VULGARIS*, *Butl.*—*a-c*, ♂. Jebba, Niger River; May, September, 1898.

8. *YPTHIMA SIMPLICIA*, *Butl.*—*a*. Leaba; December, 1899.

This species seems to be widely distributed, specimens being recorded in the National Collection from Somaliland, Victoria Nyanza, Zomba, Fwambo, and Wadelai.

9. *YPTHIMA DOLETA*, *Kirby.*—*a*, ♂. Jebba, Niger River; September, 1898. *b*, ♀. Lokoja; May, 1898.

10. *YPTHIMA ITONIA*, *Hewits.*—*a*. Shonga; August. *b*. Jebba, Niger River; October, 1898.

Family ACRÆIDÆ.

11. *ACRÆA ZETES* (*Linn.*).—*a*, ♂. Lokoja; May.

12. *ACRÆA CÆCILIA* (*Fabr.*).—*a-d*, ♂ ♀. Jebba, Niger River; September, October, 1898. *e-g*, ♂ ♀. Ilo; March, 1899. *h*, ♀. Shonga; September.

13. *ACRÆA PSEUDEGINA*, *Westw.*—*a-d*, ♂. Lokoja; May. *e*, ♂. Mount Patti, Lokoja; May, 1899. *f, g*, ♂ ♀. Jebba; May, 1898. *h-j*, ♂. Ilo. *k*, ♂. Sierra Leone; February, 1898.

14. *ACRÆA SERENA* (*Fabr.*).—*a*. Leaba; December, 1899. *b, c*. Shonga; August. *d-g*. Jebba, Niger River; September, 1898.

15. *ACRÆA VINIDIA*, *Hewits.*—*a-i*. Jebba, Niger River; May, September, 1898. *j*. Mozum, Benue River; June, 1899.

16. *ACRÆA BONASIA* (*Fabr.*).—*a*. Shonga; August.

17. *ACRÆA LYCIA* (*Fabr.*).—*a, b*. Boussa; December, 1898. *c-j*. Shonga; August, September.

"*Acraea lycia*, *A. pseudegina*, and *A. cæcilia* were exceedingly common along the banks of the River Niger."—C. C.

18. *PLANEMA GEA* (*Fabr.*).—*a, b*, ♂. Sierra Leone; February, 1898.

19. *PLANEMA UMBRA* (*Drury*).—*a*, ♀. Mozum, Benue River; June, 1899.

"Caught in an open glade in the thick jungle on the right bank of the Benue River."—C. C.

Family NYMPHALIDÆ.

20. *ATELLA PHALANTHA* (*Drury*).—*a*. Shonga; August. *b-e*. Ilo; March, 1899. *f*. Jebba; May. *g, h*. Lokoja.

21. *PYRAMEIS CARDUI* (*Linn.*).—*a-e*. Jebba; October.

22. *JUNONIA BOÖPIS*, *Trimen.*—*a*, ♂. Leaba; December, 1899. *b*, ♂. Jebba; November. *c, d*, ♂ ♀. Ilo; January, 1899.

23. *JUNONIA CLELIA* (*Cram.*).—*a*, ♀. Shonga; August. *b, c*, ♂ ♀. Ilo; March, 1899.

24. *JUNONIA CEBRENE*, *Trimen.*—*a*, ♂. Jebba; May. *b-d*, ♂ ♀. Ilo; January, March, 1899. *e*, ♀. Boussa; December.

"*Junonia boöpis*, *J. clelia*, and *J. cebrene* frequent the most exposed stony and glaring hot places. They are difficult insects to catch."—C. C.

25. *PRECIS AMESTRIS* (*Drury*).—*a*. Ilo; March, 1899.

26. *PRECIS TRIMENI* (*Butl.*).—*a*. Shonga; September.

27. *PRECIS CUAMA* (*Hewits.*).—*a, b*. Jebba; October, November.

The species seems to be widely distributed, specimens in the British Museum being recorded from Masailand, Nyasaland, and Mashona.

28. *PRECIS CERYNE* (*Boisd.*).—*a, b*. Shonga; August.

29. *PRECIS LEODORA* (*Godt.*).—*a*. Jebba; September.

30. *PRECIS PELARGA* (*Fabr.*).—*a*. Shonga; August.

31. *PRECIS TEREA* (*Drury*).—*a, b*. Sierra Leone; February, 1898. *c*. Lokoja, 11,000 ft. above river; May. *d, e*. Jebba; May. *f, g*. Ilo; March, 1899.

32. *PRECIS ORTHOSIA* (Klug). — *a*. Lokoja. *b*. Boussa; December. *c*. Jebba; May. *d-g*. Ilo; March, 1899.

"Common in the thicker parts of the jungle."—C. C.

33. *HYPOLIMNAS MISIPPUS* (Linn.). — *a-d*, ♂ ♀. Ilo; March, 1899. *c*, ♂. Boussa; January, 1898.

34. *NEPTIDOPSIS OPHIONE* (Cram.). — *a*. Mozum, Benue River; June, 1899.

35. *BYBLIA GÖTZIUS* (Herbst.). — *a-g*, ♂ ♀. Ilo; March, 1899. *h*, ♂. Jebba; October.

36. *NEPTIS AGATHA* (Stoll.). — *a*, ♀. Shonga; September. *b*, ♂. Jebba; September, 1898. *c*, ♂. Rabba; November. *d*, ♂. Boussa; December.

37. *NEPTIS MELICERTA* (Drury). — *a*. Ilo; March, 1899.

38. *CATUNA CRITHEA* (Drury). — *a*. Mozum, Benue River; June, 1899.

39. *HAMANUMIDA DÆDALUS* (Fabr.). — *a, b* Ilo: January, 1899. *c*. Ilo; February, 1899. *d-f*. Jebba; November. *g*. Boussa; December. *h, i*. Shonga; August. *j, k*, ♂ ♀. Mount Patti, Lokoja; June.

"Common on shady paths, settling with the wings open, thus escaping observation unless it rises, when it is difficult to catch, owing to its strong flight."—C. C.

40. *EUPHÆDRA THEMIS* (Hubn.). — *a*. Ilo; March, 1899.

41. *EUPHÆDRA JANETTA* (Butl.). — *a*. Jebba; May.

42. *EUPHÆDRA CROSSEI*, sp. n. — ♂. Primaries differing from the typical *E. crockeri*, Butler, in having a large ochre-yellow patch on the apical area, as well as a yellowish bronze shading along the inner margin. Secondaries: Central area rather more uniform steel-blue, the other spots and markings not differing from those indicated in other varieties of *E. crockeri*. Under side similar to that of *E. crockeri*. Expanse, 2·4 in.

Hab. Mozum, Benue River; June, 1899. Type.

This species, which belongs to the *E. crockeri* group, has apparently not been named. Two specimens are in the British Museum, one from the Cameroons, and the other from the Lower Niger (Asaba?), collected by Dr. E. W. Crosse. In this genus some of the species have a yellow phase, but whether this can be attributed to a seasonal change of colour remains to be determined.

43. *CHARAXES ACHÆMENES*, Feld. — *a*, ♀. Lokoja; May.

44. *CHARAXES VIOLA*, Butl. — *a*, ♀. Lokoja; May.

45. *CHARAXES VARANES* (Cram.). — *a*. Ilo; March, 1899.

(To be continued.)

VARIATION IN THE GENUS *EREBIA*.

BY GEOFFREY SMITH.

(Continued from p. 9.)

SUFFICIENT stress has not been laid upon the fact that when the mean (M) of a normal scheme of distribution of certain variations is preserved from generation to generation, the measures of those variations will tend to converge toward that mean. It was on this ground that the acquisition of constancy by some character was stated to occur, when both sexes were variable, and all prepotent tendencies to reversion were theoretically eliminated.

One of the properties of M of a normal scheme was stated to be that the most probable value of any unknown measure in a group is M. This results from the following consideration, in the words of Prof. Galton, "that if N be one of the measures, and U be the value of the unit in which the measure is recorded, then the number of measures that fall between $(N - \frac{1}{2} U)$ and $(N + \frac{1}{2} U)$ is greatest when $N = M$." Or from a somewhat different point of view, the idea of mediocre may be extended away from the mean so as to include more measures; but the idea of extreme cannot be so extended, since by the nature of things it is strictly limited. It must also be remembered that as a matter of fact in a normal scheme the mediocre is always the commonest condition, and that the numbers of individuals possessing the various degrees of the character on each side of the mean (M) graduate away, and become less as the extremes are approached. Hence it is that in schemes of distribution applied to the same group from generation to generation a centripetal tendency would hold good, with the final theoretical result that the mean would be established as a constant measure of the character under consideration. Moreover, this tendency to converge toward the mean, is increased in the process of sexual reproduction; for, if we take an extreme male, the chance is small of its pairing with a female which is extreme in the same direction, as against the combined chances of its pairing with a female either of the opposite extreme or of the mediocre. In this way, too, the extremes would tend to merge into the mediocre. Of course, all these considerations only hold absolutely, supposing that the scheme is normal, that the selection of mates is made entirely by chance, and also *ex hypothesi* that the numbers of the sexes are proportional.

We will now go on to consider the numerical proportions of the sexes with reference to the genus *Erebia*.

In chap. viii. part ii. of the 'Descent of Man' (2nd edition), Darwin has written on this subject: the point of view taken is that normally equal numbers of the sexes should be produced,

but that various circumstances tend to upset this equal proportion. Among men, mammals in general, birds, fish, &c., various conditions occur from equality to great preponderance of one sex or the other, and equally various circumstances seem to determine these conditions. Among Lepidoptera various conditions in the numerical proportions also occur; in silk-moths the females are said to be bred in excess; in Rhopalocera the general impression of collectors is that males are produced in excess. We are not here concerned with the actual production of males or females, but of their arrival to the state of sexual maturity; so that what we have to examine is this impression of collectors. Two views may be taken—(1) that owing to differences in habits, times of appearance, &c., of the two sexes, this impression of collectors is a mistaken one; (2) that this impression is a true one. The former view was taken by Mr. Stainton, the latter by Mr. Bates, in the discussion before the Entomological Society in 1868. It seems probable that there is truth in both views, so long as each is not applied to Rhopalocera in general. No doubt if the two sexes of a species have different habits, &c., collectors who are ignorant of those habits would very likely gain a wrong impression of the numerical proportion of the sexes; but if such a disparity in the habits does not exist, it is an unwarrantable position to ignore the repeated assertions of collectors. Now, with the genus *Erebia* I do not think there is any great difference in the habits of the sexes. Whenever I have taken a female of the species that I have collected (and I have taken many), I have done so generally unwittingly until the capture has been made, and usually I have caught females flying on the same ground with males, from which they are indistinguishable in general appearance, flight, &c., and conspicuousness. Then again, even supposing that the females do lie hid more than the males, or occur at different periods, it would be rash to suppose that a collector of even moderate attainments does not state or even understate the numerical disproportion of the sexes by the collections he brings home; for, knowing the supposed rareness of the females, he will always retain them when they are caught, whereas he will continually pass by or let go the commoner males. Considering the abundance of many species of *Erebia*, I think that the collections brought home probably understate the numerical disproportion of the mature sexes.

The proportions given to the species considered afterwards are derived from my collection, and from the collections in the British Museum. Here again the risk run is one of understatement, for in the latter collection many specimens have been ejected, and these will be sure to have been mostly males, owing to the scarcity of females for representing types.

In applying the methods, that have now been discussed at some length, to actual data derived from the genus *Erebia*, my

object is to discover whether those data give any evidence as regards the hypothesis, that inequality in the numerical proportions of the sexes, when coupled with variability in the preponderating sex, tends towards continued fluctuation of the variable character. Of what nature, then, will the data be that will lend support to this hypothesis? It is a matter of very general observation that when the ordinary individual variations of a species are thrown into a scheme of distribution, the curve derived from them is normal. The essential property of a normal curve is that it falls away symmetrically on either side of M by regular gradations, the numbers becoming gradually less below, and more above the mean. Curves A and B in Fig. 1 are therefore not truly normal, but curve C is. [See Entom. Oct. 1901, p. 278.]

Now, on the theory under discussion, we would not expect the individual variations to fall into a normal curve, if the sexes are disproportional, &c.; there should be breaks in the continuity of the slope, if the principle in question has come into play. If, of course, we take individuals from many different areas, or from one very large continuous area, we might obtain a normal curve, owing to the whirligig of chance having brought in his revenges, and filled up the breaks of continuity in one area with individuals from another; but if we take individuals from one somewhat confined area, we should expect to find these breaks. By breaks in the continuity of the slope, breaks in the actual series of variations are not necessarily implied. The latter breaks, namely, when some variations are omitted altogether, might be accounted for by natural selection; but when in some confined area all the variations do occur, but not in such numerical proportions as to fall into a normal scheme, then the facts are most easily accounted for by the hypothesis that has been framed. A confirmatory test besides this of abnormality of slope would be in the M of individuals of some confined area not corresponding to M of other areas, taken separately or combined. The method then will be to fix on some species with numerical disproportion of sexes, to select some character of that species which is variable in the preponderating sex, then to determine if that character falls into a normal scheme or not when a group of individuals is considered that has been derived from some one confined area, and also if the M of those from the confined area is the same as the M of other areas taken separately or combined. The conclusions arrived at from the following data must be accepted tentatively, as my material is not large enough to ensure anything like accuracy.

(To be continued.)

GYNANDROUS EXAMPLES OF *AMPHIDASYS BETULARIA*.

MR. ALBERT HARRISON has been good enough to entrust to me six of the seven gynandrous *A. betularia* that he bred from a batch of ova obtained from a female specimen taken in the New Forest in June, 1900 (Entom. xxxiv. 203, 349). These specimens have been submitted to Sir George F. Hampson for examination. As it was not permissible to mutilate the insects in any way, attention has necessarily been confined to the secondary sexual characters, and the results of his examination have been tabulated by Sir George as follows:—

- | | | |
|--------|---|--|
| No. 1. | Right side ♂ antenna, frenulum, and retinaculum. | Left side ♀ antenna, frenulum, and retinaculum. |
| No. 2. | Right side ♂ antenna, frenulum, and retinaculum. | Left side ♀ antenna, frenulum, and retinaculum. |
| No. 3. | Right side antenna unipectinate, ♀ frenulum, ♂ retinaculum. | Left side ♂ antenna, ♀ frenulum, ♂ retinaculum. |
| No. 4. | Right side ♂ antenna, ♀ frenulum and retinaculum. | Left side ♀ antenna, ♀ frenulum and retinaculum. |
| No. 5. | Right side ♂ antenna, ♂ frenulum and retinaculum. | Left side ♀ antenna, ♀ frenulum and retinaculum. |
| No. 6. | Right side ♀ antenna, ♂ frenulum and retinaculum. | Left side ♂ antenna, ♂ frenulum and retinaculum. |

From this table we see that, as regards external organs, Nos. 1, 2, and 5 are each male on the right side and female on the left side. I find that the wings themselves also exhibit the same sexual differences, and if one may judge from the appearance of the anal segments of the body it would seem that these are also "half and half."

No. 4 appears to be a female in all respects except that it has a male antenna on the right side.

No. 3 has the wings on each side of equal size. There is a well-formed male antenna on the left side, but the right antenna is that proper to the female with some short pectinations along its lower side, an abnormal position.

Except that it has a female antenna on the right side, No. 6 appears to be a male specimen, and comes nearest to being a counterpart of either Nos. 1, 2, or 5. It is not, however, the exact reverse of either, because the frenulum and retinaculum on the right side are male in character.

RICHARD SOUTH.

NOTES AND OBSERVATIONS.

HAWK MOTH PUPATING IN BRANCHES OF TREES.—During February larvæ of *Panacra lignaria* were common here on *Pisonia aculeata*. One large creeper, which clambered up and over a tall tree, was quite denuded of its foliage by them. Whilst examining some shrubs and young trees which grew immediately underneath, I discovered many of the larvæ spun up therein; continuing my search, I found many more changing, and an occasional pupa, in the branches. Some were close to the ground, others being seven or eight feet therefrom, probably many more were higher up. Though larvæ of many of the Queensland Sphingidæ are known to me, this is the only species which I have observed to pupate above ground. I have referred to several of our experienced entomologists, and none of them have known of Sphingidæ pupating in trees.—F. P. DODD; Warburton Street, North Ward, Townsville, Queensland.

SCENT ORGANS OF HEPIALIDÆ.—During a lengthened experience with the southern Hepialidæ, I have always noticed a powerful and somewhat pleasant scent emanating from the male of *Charagia daphnandri* (should be *scotti*), and was for some time unable to locate the organ from which it proceeded, but finally discovered that the large hair-like tufts on the diminutive hind legs of this species gave forth the scent. It will be noticed that each of these hairs is enclosed from the base to some little distance above in a delicate skin, forming a gland. These glands proved to contain a yellowish fluid, the fluid possessing the strong scent so noticeable in freshly emerged and handled males of this species. In *ramsayi*, *cyanochlora*, *splendens*, and others, the tufts of the male are much smaller, and I have not noticed any pronounced odour arising from any of these. During the past two years I have bred out a series of the magnificent *mirabilis* of Rothschild, which is the largest and generally considered the finest of Queensland Hepialidæ; the male has the tufts largely developed, and they, too, give forth a powerful and sweet scent, which is also secreted at the base of the hairs. The scent from these two species does not finally depart until long after the insects have been placed away in the store-boxes.—F. P. DODD.

BAT KILLING A MOTH AT SUGAR.—While my sister, Miss Harvey-Jellie, was sugaring in a garden in Essex last September, a large bat swooped down just as she was approaching a tree, and, in the full light of the lantern, settled on the patch of sugar, demolished a *M. brassica*, and flew away.—B. HARVEY-JELLIE; Moorside, Hartlepool.

VARIETY OF THE MOTH HYPSA SUBTRACTA (Walker).—Having bred a very large number of specimens of *H. subtracta* last year, and several this, among which were a good many of the banded variety, and also a few other examples, I think a specimen which emerged to-day, September 8th, is worth noting. The fore wings are quite typical, but the right hind wing has a distinct band, which is totally different from the ordinary banded form; the other hind wing is like the type, all yellow. Besides those I have bred myself I have also seen a great number of others, but nothing like the one now recorded. The

specimen, which is a male, was bred from a pupa found by me about three weeks ago, and was not reared in confinement. The insect is now in the possession of P. T. Lathy, Esq., Enfield, England, to whom I forwarded it.—G. F. LEIGH; Musgrave Road, Durban, Natal.

HYMENOPTERA-ACULEATA OF THE OXFORD DISTRICT.—The report of the Oxfordshire Natural History Society and Field Club for 1900 (recently received) is accompanied by a list of the Aculeate Hymenoptera of the Oxford district. The species enumerated number two hundred and eight, and comprise ten Heterogyna, sixty-two Fossores, fifteen Diploptera, and one hundred and twenty-one Anthophila.

LIST OF BRITISH DIPTERA (2nd Edition).—Even if the addition to the faunal lists of some three hundred species, and still more numerous important emendations and alterations, had not indicated the pressing need of a new edition of Mr. Verrall's invaluable list of British Diptera, it appears that the original edition was exhausted, and that a reprint had become a necessity. Although the author is not yet satisfied with the list as regards accuracy and completeness, we are sure that this revised edition will be gladly welcomed by dipterists. In the preface, reference is made to the increased interest in British Diptera, and the hope is expressed that this may lead to the production of more perfect lists than is possible at present of such families as the Cecidomyiidae and the Mycetophilidae.

CAPTURES AND FIELD REPORTS.

COLIAS HYALE AND SPHINX CONVULVULI IN WILTSHIRE IN 1901.—I wish to record the capture here last year, on Sept. 18th, of a female specimen of *Colias hyale*, which I released, upon identification. This is the first and only one I have seen in this neighbourhood during many years. I also caught a female *Sphinx convolvuli* on the evening of Sept. 23rd, which I restored to liberty; and I noticed this same insect, or others of its kind, on several subsequent evenings, at the flowers of *Nicotiana affinis*.—(Rev.) C. A. SLADEN; The Rectory, Alton Barnes, Pewsey, Feb. 14th, 1902.

OPHIODES LUNARIS: A CORRECTION.—In my record of the above species (*ante*, p. 25), I should have said that it was exhibited at the City of London Entomological Society on Dec. 3rd, 1901, not at the Entomological Society of London on the 6th.—T. WRIGHT; Heath Side, Warrington, Jan. 9th, 1901.

ODONATA, &c., AT CAMBERLEY, SURREY.—*Libellula depressa*, *L. quadrimaculata*, *Sympetrum striolatum*, *Aeschna cyanea*, *Lestes sponsa*, *Agriopuella*, and *Pyrrosoma nymphula* were very plentiful at Camberley in 1900. I got several specimens of *Cordulegaster annulatus*, and three of *Orthetrum caeruleum*, two of which were caught in an orchard. Of Coleoptera, I met with *Cicindela campestris*, *Cryptocephalus aureolus*, and *Cetonia aurata* continually, and a gardener gave me thirteen specimens of *Geotrupes stercorarius*, males and females, which he had caught on the way to Bagshot.—M. PALLIS; Tatōi, Aigburth Drive, Sefton Park, Jan. 4th, 1902.

HARPELLA BRACTEELLA. — A specimen of this rare species was brought to me for identification by Mr. J. T. Houghton, who took it in this town on June 23rd of last year.—(Miss) E. MAUDE ALDERSON; Park House, Worksop.

NOTES ON THE SEASON, 1901: MARCH-JUNE.—On the whole, collecting has, I think, been satisfactory during the past season. In the immediate neighbourhood a few unusual species turned up. *Colias hyale* was seen at Hither Green, Sept. 22nd, and others were heard of from there. An example of *Vanessa polychloros* was found indoors, as already reported, whilst both broods of *Cyaniris argiolus* were well represented. A single *Sphinx convolvuli* was brought to me Sept. 25th, which was taken at rest on some clothing in a yard near Lee station. It was unfortunately in battered condition, owing to having been kept alive in a cigar-box for three days. The usual species turned up, and single specimens of *Eupithecia succenturiata* and *Cosmia diffinis* (Grove Park) were taken. A black female *Amphidasys betularia* was secured, *in cop.* with a typical male, and was kept for eggs, of which she deposited a large number. Some of the larvæ fed up well, and we now have a good number of pupæ. A single larva of *Iodis vernaria* was taken at Grove Park.—F. M. B. CARR; 46, Handen Road, Lee, S.E.

THE PAST SEASON, 1901.—The season of 1901 which has just closed I have again found, with one or two exceptions, a good one for butterflies. On referring to notes, I find the first specimen observed was one of *Vanessa io*, at Clifton, Bristol, on March 12th, no doubt tempted forth from its winter quarters by a warm day. *Gonepteryx rhamni* appeared on the 13th of same month. The weather being again colder after this, *Pieris rapæ* was not noted before April 21st, and on the 25th *Lycæna argiolus* turned up. On the Cotswold Hills, in Gloucestershire, in May, I was pleased to find several kinds in fair abundance, as *Euchloë cardamines*, *Polyommatus phlœas*, *Lycæna icarus*, *Thecla rubi*, *Argynnis euphrosyne*, *Thanaos tages*, &c., and the "whites." During June and July, in North Wales, Merionethshire, *Argynnis aglaia* and *A. adippe* were frequently seen in favourable situations; also *A. selene* and, locally, *Melitæa artemis* (*aurinia*) and *Cænonympha pamphilus* were in abundance amongst the coarse grass on the uplands. *Vanessa urtica* was very frequently seen, and I was pleased to notice several specimens of *Polygonia c-album*, not far from Barmouth, and the "whites" were very abundant. *Thecla quercus*, also, was continually seen flitting over the oak trees, this, as is often the case, especially when the sun was declining in the afternoon. On passing through Bath, the second week in August, I found one evening, on one of the hill slopes, *Lycæna icarus* in greater abundance at rest than I think I have ever before noticed it. Without moving, several dozens might be counted on the stems of grass or plantain—so many as four specimens might be seen on a single grass stem alone. In West Somerset, at the end of August and through September, the butterflies then out have been generally seen, as *V. urtica*, *Chrysophanus phlœas*, *L. icarus*, *T. quercus*, &c., but *atalanta* I have not found so commonly as last season in Devonshire. *Pararge egeria* was noted so late as October 17th, and a specimen each of *V. io* and *C. phlœas* were the last butterflies of the season of 1901; these were seen on October 23rd. During the whole year not a single speci-

men of *Vanessa cardui* or *Colias edusa* has been noticed in the places above mentioned. My observations of the moths have been mostly confined to day collecting, excepting examining on one or two evenings many plants of the red valerian in North Wales, to which the common moths came plentifully, as *Xylophasia polyodon*, *M. brassicae*, *Hadena dentina*, &c.; the last seems generally common in many parts of Wales. The larvæ, pupæ, and imago of *Zygæna filipendula* were extremely abundant near Barmouth—the pupæ spun up in all kinds of places, even on rocks, and wood palings; the imagines were most constant in their markings, excepting an occasional one with the spots rather smaller. *Macroglossa stellatarum* occasionally visited the red valerian in the same district, and later on I have now and then seen this insect in West Somerset, where, also, larvæ and pupæ of *Acherontia atropos* have been found not unfrequently. The larvæ of the “whites,” and, in one place apparently, of *Pionea forficælis* have been very destructive. I may, perhaps, add a word here for that often much abused bird, the house sparrow—of his usefulness, often forgotten, in destroying both the larvæ and imagines of troublesome insects. This season alone I have seen him devouring the larvæ of *Malacosoma* (B.) *neustria*, and *Cheimatobia brumata*, and imagines of *Phlogophora meticulosa* and *Triphæna pronuba*. The dry, warm season appears to have been favourable to wasps; and in June and part of July the little chafer-beetle, the Welsh “Coch y bouddhu,” appeared in swarms near Barmouth, on the uplands. I noticed one day the surface of a tarn dotted over with struggling victims, and the bracken and low nut-bushes were at times covered with them.—T. B. JEFFERYS; Minchhead, Nov. 4th, 1901.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—*February 5th, 1902.*—The Rev. Canon Fowler, M.A., F.L.S., President, in the chair.—The President announced that he had appointed Mr. F. DuCane Godman, D.C.L., F.R.S., Professor E. B. Poulton, M.A., D.Sc., F.R.S., and Dr. David Sharp, M.A., F.R.S., F.L.S., as Vice-Presidents for the Session. Dr. Norman Joy, of Bradfield, near Reading, was elected a Fellow of the Society.—Professor Poulton exhibited with lantern a series of slides belonging to Professor Meldola, made from actual specimens by the three-colour process, illustrative of mimicry in British and exotic Lepidoptera and Hymenoptera. He also exhibited the several specimens from which the lantern-slides had been prepared. A discussion on the subject took place, in which Col. Swinhoe, Mr. F. Merrifield, Dr. Chapman, Mr. C. O. Waterhouse, the Rev. F. D. Morice, and Col. Yerbury took part, Mr. Verrall observing that in the case of Diptera they mimicked other groups rather than were mimicked by them, while there were even cases in which flies fed on dragonflies, and not *vice versâ*, as was usual. With regard to the protective value of the scent-glands present in groups allied to the Chalcosiinæ, and conspicuous also in *Anthrocera*, Mr. J. W. Tutt said it was possible that they might have something to do with edibility.

otherwise of the species. The glands, though better developed in the male, existed also in the female. Professor Meldola, however, supposed them to be characters of sexual attraction, as laid down by Fritz Muller, and therefore not affecting the question of distastefulness.—Mr. C. G. Barrett exhibited a series of the perfect insect of *Glottula fusca*, Hpsn., together with ears of maize (locally called mealies), showing the damage done by the well-grown larva of the species, which lives in the first place in the stem, eating the pith from the ground, and afterwards attacking the cobs, and eating from the inside into the bases of the unripe grains, which then change colour and shrivel up. He also exhibited: *Gynaniza maia* (male), Walk., and a drawing of the larva; *Nudaurelia menippe* (male), Feld., and drawing of larvæ; *Bombycomorpha bifascia*, Hpsn., circlet of eggs, cocoons, and figure of larva; *Phissana flava*, Feld., food, cocoon, and figure of larva; *Gonometa postica* (male and female), Walk., cocoon (poisonous), and male and female larva figures; *Henucha smilax* (male and female), Feld., pupa, cocoon, figures of larva, and an enlarged segment to show markings; *Metarctia rufescens*, Walk., and figure of larva; *Tæniopyga sylvana*, Walk., and figures of larva; *Rigema ornata*, Walk., and figures of larva—all the foregoing specimens and figures being received from Miss Frances Barrett, Buntingville, Transkei, South Africa.—Mr. W. L. Distant exhibited two specimens of Coleoptera which had reached him alive from the Transvaal—one *Anthia thoracica*, Thunb., now dead, the other, *Brachycerus granosus*, Gyll., still living, sent by Mr. Robert Service, of Dumfries, who received them from Sergt. Peter Dunn, of the volunteer company of the Scottish Borderers, which regiment was in the vicinity of the village of Krugersdorp. The genus *Anthia* extends to the Southern Palæarctic region, and there seems little doubt that these species could be easily acclimatized there. All they require at home is the run of a good palm or orchid-house.—Mr. R. Adkin exhibited a series of *Acidalia aversata*. The parent moth (a banded female, the male parent not being known) was taken at Lewisham in June, 1900. Of the resulting larvæ about one-half fed up rapidly, and produced imagines in the autumn of the same year—a very unusual circumstance in the habits of the species; the remainder hibernated and produced imagines in June of the following year, thus occupying the normal time in completing their metamorphoses. The proportion of individuals following the female parent in the two portions of the brood were almost equal, the percentages being approximately fifty-three banded in the autumnal emergence as against fifty-eight in the spring, but in point of sex the disparity was great, over 65 per cent. of the autumn moths being males as against fully 72 per cent. females in the spring portion.—Mr. G. C. Champion exhibited long series of *Leptura stragulata*, Germ., and *Strangalia pubescens*, Fabr., from the pine-forests of Aragon and Castile, showing the great variation in colour of the two species in these districts, whereas the allied forms occurring in the same places, viz., *L. rubra*, Linn., *L. distigma*, Sharp., *L. unipunctata*, Fabr., and *L. sanguinolenta*, Linn., were perfectly constant; also *Dermestes aurichalceus*, Küst., which he and Dr. Chapman had found everywhere in abundance in the old nests of the processionary-moth (*Cnethocampa processionea*, Linn.) on the pines in these forests.—Dr. T. A. Chapman exhibited in illustration of his

paper "On a new subfamily of Pyralidæ," living larvæ of *Hypotia corticalis*, Schiff, as well as preserved larvæ, pupa-cases, imagines, and prepared wings to show the neururation of that species. — Mr. Edward Meyrick, B.A., F.Z.S., communicated "Descriptions of new Australasian Lepidoptera." — Mr. W. F. Kirby, F.L.S., communicated a "Report on a Collection of African Locustidæ, chiefly from the Transvaal, made by Mr. W. L. Distant."—H. ROWLAND-BROWN, *Hon. Sec.*

SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—*January 9th, 1902.*—Mr. W. J. Lucas, B.A., F.E.S., Vice-President, in the chair.—Mr. Tonge, Redhill, Surrey, was elected a member.—Mr. Hewitt exhibited a specimen of the rare Homopteron, *Cicadetta montana*, taken flying in Stubby Copse, New Forest, on July 7th.—Mr. R. Adkin, five specimens of *Melanippe galiata*, which emerged on Dec. 8th last, in a cage outdoors and protected only from rain and direct sunshine. The ova were laid towards the end of August.—Mr. McArthur, specimens of *Triphana comes*, bred on Dec. 26th and 27th, from ova laid in July by an Isle of Lewis female.—Mr. Main, slides made by himself of the larvæ of *Samia cecropia*, and of *Amphidasys betularia*; of the imago of *Pieris napi*, drying its wings after emergence from the chrysalis case; and of a batch of ova of *Macrothylacia rubi* on a sprig of heather.

January 23rd.—*Annual Meeting*, Mr. F. Noad Clark, Vice-President, in the chair.—The Twenty-ninth Annual Report was read, and showed that the Society was in a very satisfactory condition, both in membership and finances; and had carried on with much success its educational and scientific work. The present number of members is 174, and the balance-sheet showed a very fair balance, with no liabilities.—The following is a list of the Officers and Council elected for the ensuing year:—President, F. Noad Clark; Vice-Presidents, H. S. Foreman, M.R.C.S., F.E.S.; E. Step, F.L.S.; Treasurer, T. W. Hall, F.E.S.; Librarian, H. A. Sauzé; Curator, W. West; Hon. Secretaries, Stanley Edwards, F.L.S., F.E.S., Hy. J. Turner, F.E.S.; Council, W. J. Ashdown, J. H. Carpenter, F.E.S., T. A. Chapman, M.D., F.E.S.; A. Harrison, F.C.S., F.L.S.; W. J. Lucas, B.A., F.E.S.; H. Main, B.Sc., F.E.S., and J. W. Tutt, F.E.S.—Mr. R. Adkin exhibited a long series of *Acidalia aversata*, and read notes on their life-history and variation.—Mr. Garrett, a living specimen of *Dasychira pudibunda*, which had just emerged in the open.—Dr. Chapman, forms illustrative of the geographical races in Spain and Switzerland of the butterfly *Polyommatus corydon*, *Lycæna damon*, and *L. hylas*.—Hr. J. TURNER, *Hon. Rep. Sec.*

BIRMINGHAM ENTOMOLOGICAL SOCIETY.—*December 16th, 1901.*—Mr. G. T. Bethune-Baker, President, in the chair.—Mr. A. H. Martineau showed Hymenoptera from Tubney, near Oxford, in Berks, a sandy locality; they included *Cleptes pallipes*, *Crabro palmarius*, and *Nyssa dimidiatus*.—Mr. A. D. Imms showed empty cocoons and pupa-shells of *Ecophora sulphurella*, from Moseley.—Mr. G. T. Bethune-Baker, a collection of Liptenæ and Pentilæ, subfamilies of the Lycenidæ, from South Africa, which are remarkably mimetic; some were strikingly like Acreidæ; others were very like Pieridæ, like some Geometridæ and many other groups of Lepidoptera, the resemblance being in

various degrees of perfection, in some cases almost perfect. There seemed no explanation for the resemblances to some species, such as some of the Geometrid forms.—Mr. C. J. Wainwright, a small collection of Chrysidids, including *Chrysis viridula*, from Wyre Forest; *C. cincta*, from St. Ives, Cornwall; *Hedychridium roseum*, from West Runton, Norfolk; *Ellampus caeruleus*, from West Runton; and West Hide, near Hereford; and *Chrysis pustulosa*, from West Hide.—COLBRAN. WAINWRIGHT, *Hon. Sec.*

RECENT LITERATURE.

Insect Life: Souvenirs of a Naturalist—J.-H Fabre, D.-ès-Sc. Translated from the French. By the Author of 'Mademoiselle Mori.' With a Preface by D. SHARP, M.A., F.R.S. Pp. 320. London: Macmillan and Co. 1901.

A TRANSLATION generally declares itself as such; this one does not. Possibly this is due to the fact that, as Mr. Sharp says, Fabre is a difficult writer to translate. The book before us, which pictures to its readers the habits of a few beetles and Hymenoptera, is a translation of the first volume of Fabre's 'Souvenirs Entomologiques,' of which there are now seven series. If all are as interesting as this volume, we hope the rest may soon be presented to us in English garb. The writer is a genuine field-naturalist, and has a charming way of giving the details of his observations in such a way that the reader almost fancy he is making the observations for himself. The ingenuity, too, with which experiments in the field are made to assist the writer in his observations, takes hold of one and keeps his attention fixed in an ordinary manner. There are sixteen full-page pictures, but, though the insects portrayed on them are good, we hardly care for the style; this, however, is perhaps only a matter of taste.

W. J. L.

OBITUARY.

CHARLES LIONEL DE NICÉVILLE belonged to a noble Huguenot family, and was born at Bristol in 1852. In the year 1876 he proceeded to India, where he commenced the formation of a collection of butterflies, which he sold to the Asiatic Society of Calcutta some years afterwards. He travelled extensively in various parts of India, and at the time of his death had amassed one of the finest private collections of the butterflies of that country, which, we understand, has been purchased by the Indian Museum for Rs. 20,000 (about £1300). His first published papers were issued in conjunction with the late Prof. Wood-Mason, but he also published a great number of lists, with descriptions and illustrations of numerous new species of the butterflies of various parts of India, chiefly in the Journal of the Asiatic Society of Bengal, and in the Journal of the Bombay Natural History Society. His most important work was the 'Butterflies of India, Burmah

and Ceylon,' of which three volumes—including the whole of the families Nymphalidæ, Lemoniidæ, and Lyceenidæ—appeared from 1881 to 1890. The first volume was by Capt. G. L. F. Marshall and Lionel de Nicéville, but the remainder were by de Nicéville only. It is much to be regretted that this valuable work remains a fragment. Subsequently, Mr. de Nicéville was appointed Government Entomologist, Indian Museum; and it was while engaged in official investigations in the Terai, near Darjeeling, that he contracted the fever of which he died, at Calcutta, on Dec. 3rd, 1901. His death came as a shock to his numerous friends in India and Europe, and is a great loss to the cause of Indian entomology.—W. F. K.

MAJOR ALFRED FICKLIN.—On February 4th, at the comparatively early age of sixty-three, Major Ficklin succumbed to an attack of apoplexy, after an illness of but a few days' duration. As an entomologist he was essentially a practical one, and few perhaps knew better than he the collecting-grounds of north Surrey, and what they were able to produce in the way of Lepidoptera. Field-naturalists, therefore, of the south of London will miss greatly from their ranks his well-known figure. Major Ficklin was almost or quite one of the very first members of the South London Entomological and Natural History Society, of which he was President in 1880, and it is, perhaps, amongst members of that Society that he was best known, and by them his genial company and quaint entomological and fishing yarns (for he was a fisherman, too) will not soon be forgotten. It was his great delight to assist beginners in Entomology, and the members of a school Natural History Society in Kingston-on-Thames, where he so long resided, will, indeed, miss from their meetings and excursions one who was so expert a breeder of insects, so diligent a collector, and who possessed withal a manner so entertaining and so capable of winning the hearts of boys. The pursuit of Entomology, however, did not claim the whole of Major Ficklin's spare time. He was an artist of no mean order, and to his education at a school in one of the loveliest parts of the Rhine valley may be due the development of his artistic taste, and perhaps also we may here find the reason why he delighted to paint scenes on the rugged Cornwall coasts. On these painting excursions time was found for entomology, too, and it was under these circumstances that he made acquaintance with the Cornish form of *Diantheria luteago*, which some entomologists have thought sufficiently distinct to need a varietal name, and have therefore termed var. *ficklini*. But even entomology and art did not exhaust the energies of Major Ficklin; for from August, 1860, he had been connected with the Kingston Volunteers, and from 1884 till his resignation in 1898 he was their commanding officer, while for many years during his long service he was one of the best shots of the battalion. Major Ficklin leaves behind him to regret his loss a widow, a daughter, and two sons, the elder of whom bids fair to keep up his father's reputation as an entomologist and an artist.—W. J. L.

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THE CLASSIFICATION OF GRACILARIA AND ALLIED GENERA.*

By T. A. CHAPMAN, M.D., F.E.S.

I DESIRE in these notes to point out that certain genera which call collectively the Gracilariadæ are connected together by certain very definite characters of their larvæ and pupæ, and by the special nature of these characters are equally cut off and separated from certain other genera with which all our systematists, up to Staudinger, or rather Rebel, following his predecessors, have more or less mixed them.

These genera are *Gracilaria*, *Ornix*, and *Coriscium* as one subgroup, *Lithocolletis* as another, and *Phyllocnistis* as a third, together with several non-European genera, this group being much more abundantly represented in America than Europe.

As a subsidiary point, I associate *Lyonetia*, *Cemiosstoma*, and *Bedellia* as a very natural group, crisply marked off by pupal characters from all other forms, with *Phyllobrostis* as probably representing a connecting form.

This being so, it is of course merely a corollary that *Tischeria* and *Bucculatrix* must find their proper place somewhere else, and not in association with these two groups or families.

I hardly know whether classification founded in earlier stages is still to fight for recognition; I hope not—I may merely say that where good characters are to be found in the earlier stages, and none in the imagines for classification, then classification by such characters is imperative. Classification by any one character; by any one stage is liable to be very erroneous, and any true

* Read before the City of London Entomological Society, March 18th, 1902. Mr. J. Hartley Durrant has very kindly looked through these notes. I mention this in order to make grateful acknowledgment, and to indicate that no gross errors of bibliography or nomenclature occur in them, but of course without for a moment desiring to make him responsible for any of my heresies.—T. A. C.

classification will be supported by every fact that we can observe, whether it be a fact of habit or of structure, of the larva, or of the imago.

Every fact that tends to group species together may be proof of relationship, probably is, but it may be an instance of what is familiar to all as convergence. Every fact that separates two species unquestionably separates them. Whether specifically, generically, or more profoundly, will usually depend on its agreement or otherwise with other similar facts, as much as on its own apparent importance. In any case of two groups being so separated the presumption is strong that the relationships within each group are closer than of any members of one group to any of the others.

The great and very frequent exception to this is where two or more groups split up by a differentiation common to all of them, usually in some character that is liable to great variation under frequently occurring changes of environment. As an extreme case, admitting no doubt, I might illustrate by saying that many species of Lepidoptera have pale and melanic races. No one would suggest that the pale races all belong to one family or genus, and all the melanic ones to another. Or, we might say that all species having apterous females belong to one family. This is not so absurd an illustration as one might suppose, since I fancy there are still to be found entomologists who think *Psyche* and *Orgyia* are very closely related, practically on this ground only.

It is but recently that the Arctiad nature of the Syntomids has been fully acknowledged, and their resemblance to Anthrocercids (Zygænidæ) admitted to be convergent only. Whilst the likeness that obtains between the Nolidæ and Lithosiadæ appears strong enough to deceive the very elect.

The objections that are raised to consideration of the earlier stages in classification include two that I may allude to. The first is usually expressed in something of this form—Is not the imago the more complete and evolved form, and ought we not therefore to classify by it, and not by the larva or pupa? This proposition is open to two serious comments. The first takes note that the objector considers that classification is to be founded on one stage only, probably on one character, or at most on a very few characters, and, having so made his classification, anything that contradicts it in any way is necessarily wrong. The second comment is—he assumes that the upholder of the use of the earlier stages in classification possesses precisely the same narrow views, and is going to classify, say, by some larval character, and flout everything that does not agree with his results. The only excuse he has is, of course, that a certain element of this nature must always exist. Life is short and art is long, but science is longer still, and so we must all specialize,

and inevitably fall victims in some degree to our more or less narrow outlook.

Another objection raised is, that we cannot classify by early stages, because of our ignorance of them in so many instances. This would be a valid objection were it the case that the demand was to ignore the imago. Such an imputation is, however, pure delusion. All that is proposed is that all the light that the earlier stages throw on the relationships of species shall be used, where we know them; that what it tells us about *a* shall be accepted, and not ignored, because it happens to be silent about *b*.

There is little doubt that the value of a knowledge of the early stages for classification became very much neglected in the eighties and early nineties, probably in consequence of the enormous numbers of new species of exotic Lepidoptera constantly coming to hand and being constantly described with often no idea whatever of their earlier stages. The same causes are no doubt still very active in the same direction, but something is being done in the opposite direction by not a few active workers.

The truth being that we require every scrap of knowledge that we can get, about every species; that the early stages are quite as important as the imaginal, as illustrating relationships, probably often more than less so; but in any case, being further information, they often guide us readily in cases where imaginal indications are obscure, and must always be useful in checking imaginal results and enabling us to see whether we have correctly interpreted imaginal facts.

It is because facts in the earlier stages are very pointed and definite in separating Gracilariadæ and Lyonetiadæ from each other and from other genera that I have selected them, partly to illustrate this point, but chiefly to secure a better classification of those families as a subject for this paper.

The characters of the Gracilariadæ that I propose to deal with are two—one larval, the other pupal.

The larval character is the very peculiar modification of the mouth parts that exists in all the species in their first two instars, continuing for further instars in some species. In all—even in *Phyllocnistis*—changing suddenly at one moult to the ordinary form. In *Phyllocnistis*, the third moult is of this character, but the mouth parts are now useless for feeding, and only available for spinning the cocoon.

The pupal character consists in the movable or free segments being reduced to the 5th and 6th abdominal, as in the obtect pupa, but with the 7th also free in the male, and the habit of protruding from the cocoon for emergence. It is, in fact, the highest form of Incomplete Pupa, with the first four abdominal segments fixed. I know of no other family, genus, or species

possessed of this type of pupa. Since, however, it is the limiting form in one line of pupal evolution, I think it is not improbable that some other group of which I am ignorant may have attained a similar structure.

There can, however, be no question that these two peculiar specializations, of the early larva and of the pupa, are unlikely in the highest degree to occur together in any other group. It is possible, but convergence in this way can hardly be expected to produce an approach in two apparently independent and unrelated characters.

I may mention that, except where I use the facts recorded by the late Vactor Tousey Chambers, to which I refer below, I have depended for my data entirely on my own observations, and therefore have to leave alone a number of American and other exotic genera. Their places are tolerably obvious from imaginal characters which associate them with those genera which I have specially examined, but I have thought it better to say nothing about them, especially as space prevents my dealing in detail even with the material I have. As, for example, though I refer to only a few species of *Gracilaria* and *Lithocolletis*, I have actually examined the young larvæ of a considerable number of species, and the pupæ of a very large proportion of our British species.

The earliest reference I can find to the peculiar structure of the mouth parts of these larvæ is in Stainton's collected papers of Dr. Brackenridge Clemens.* Clemens seems to have noticed them as early as 1857 in *Phyllocnistis*, and to have been aware that they occurred in some *Lithocolletis*.

Stainton made reference to them in connection with *Phyllocnistis* in the 'Entomologist's Intelligencer' in 1860.

In the seventies this knowledge was fairly common property, and the facts had been more or less observed by many microlepidopterists. I know that at this period my friend Dr. Wood, of Tarrington, was familiar with the main facts, and we often discussed the questions of their origin and significance, as we did many others with reference to the Micro-Lepidoptera. My knowledge of the Micros is in fact largely due to information obtained in this way from Dr. Wood.

No one apparently published anything on the subject before Chambers's papers appeared in *Psyche*, in the 'Journal of the Cincinnati Nat. Hist. Soc.' and in the American 'Entomologist' in 1877 and following years. He worked the matter out very fully and carefully, ascertained the genera in which this structural modification occurred, and also, which is most important, that they did *not* occur in any others (so far as known). There are some details in which his work is open to extension.

* These papers were originally published in the Pr. Ac. Nat. Sc. and Pr. Ent. Soc. of Philadelphia.

and emendation, but, broadly speaking, he had a complete grasp of the facts. He first, I think, pointed out the closeness of *Gracilaria* and *Lithocolletis*, now universally admitted, and would, I doubt not, had he lived and gained fuller confidence in the value of his own observations, have placed *Phyllocnistis* along with them. These papers of Chambers are characterized by a philosophical reasoning and careful observation, which will delight those who read them for the first time.

It is a little difficult by description to give you a clear picture of the specialization that occurs in the structure of these larvæ.

We have been asked, as an exercise in ontology, to consider the experiences and mental attributes that would be possessed by beings possessing only two dimensions and confined thereto, in the same way as we are confined within three. These larvæ not only had this question laid before them, but obviously experimented with a view to gain some actual knowledge on the subject. If a steam-roller went over an ordinary caterpillar, it might reduce it to some resemblance to these Gracilariads.

Their mouth-parts are profoundly altered. They are right away at the anterior angle of a flat triangular head. Each jaw is no longer a biting instrument, but a flat disc hinged at its proximal margin, and working to and fro in its own plane (that of the head and of the larva also), with a serrated margin that acts on anything in front of it like a circular saw. The two jaws may cross one another more or less, but they cut nothing between them; the cutting is done right in front by each separately. These jaws work between two thin membranous veils, one above and one below them; these are the labrum and labium. They are finely granulated and spiculated, but possess practically no palpi, no spinneret, nor any other structure, nor are any maxillæ to be detected, unless they are represented by certain obscure lines on the jaws.

In some species the appearance is as though the upper and lower veils were continuous at their margins, thus placing the jaws, as it were, at the mouth of a bag, from which they protrude sufficiently to show their cutting edge. Their manner of working suggests that this bag arrangement really exists.

The larvæ live beneath the cuticle of the leaf, which they separate from the parenchyma below by cutting through a row of cells by the circular saw action of the margins of their jaws. The fluid contents of the cells are thus set free, and fall at once into the mouth of the bag. It is probable that the sap is forced towards the œsophagus by the action of the jaws. Being confined between the veils above and below, the uncut leaf in front and the moving jaws laterally, it will be subject to a force-pump action like that of certain rotary pumps.

Chambers (American Ent., 1880, p. 260) deals at some length with the evolutionary questions that are provoked by

these curious modifications. He treats as quite open to discussion the view that these are the original forms of *lepidopterous trophi*, and that the ordinary forms are a further development, but decides against it. I think we may follow him here without the least hesitation. This group is a solitary one. There is no other group showing such modified structures, and it is a very long way indeed from being one of the lowest groups. So that it is improbable in the last degree that a primary condition like this is, if it be one, should be preserved here, and here only. This, when we consider only the Lepidoptera; but we have to remember that the ordinary form of *lepidopterous trophi* falls into line with that in other insects, whilst that of the early Gracilariad larva does not.

We are forced, I think, to conclude that this special form of larva is derived from the ordinary form by selective modification. Mr. Chambers speaks of these changes as degradation and elevation. There is a certain convenience in so doing. The absolute loss of labial and maxillary palpi, just like the loss of true legs and of prolegs, which occurs in so many other larvæ as well as these, may be spoken of as degradation. But the marvellous modification of the jaws and of the labrum and labium to enable a very special form of feeding to be carried out is rather elevation than otherwise. They are at least evolutionary changes. Whether we call them degradations or elevation is rather a matter of the personal equation of the observer than of the facts themselves. No doubt we incline to say that an organ that becomes more complicated is advancing, one that is simplified is degrading; and probably this is correct if we apply it to the organ considered, and not to the whole organism. With regard to our larva, it is specialized, therefore elevated; the jaws and labium and labrum are specialized, therefore an advance; the loss of palpi, &c., is a degradation; but the whole insect is advanced. In modification of any question of advance or retreat, we must remember that the lost processes, palpi, feet, &c., are merely in abeyance, not lost; their embryonic nuclei persist and give rise to them in the later stages.

The great interest from an evolutionary point of view of these larvæ is from a rather different aspect. Our ordinary view of larval evolution in the Lepidoptera is that during the whole of larval life selection is acting on the larva, and produces its greatest effect on the full-grown larva, and that the characters so acquired by the adult larva tend to pass backwards to earlier moults, so that a primitive condition may persist up to the last moult, or may be lost earlier, and we find as a very common occurrence some primitive condition present in the first instar, but not afterwards. And, finally, the backward pressure of evolutionary changes annexes the first instar also, and that

larva has no primitive condition, in any of its aspects that are so modified.

This picture of larval changes in the Lepidoptera is probably, to a great extent, a true one. Nevertheless, it is probably much less frequently so than we imagine.

Let us try to apply it to the Gracilarians. An ancestral larva has lived some sort of life as a leaf-miner, like a *Nepticula*, or a *Tischeria*, but in its last moult takes on the special structure of *Gracilaria*, and feeds in the Gracilarian manner, and then passes the change back to all the earlier instars. It is just conceivable; but to follow this life in its last skin, a *Gracilaria* would need a very large and very succulent leaf. It may perhaps be said that *Phyllocnistis* practically does this, though its last instar shows that even here this is not so; and we may derive the group from *Phyllocnistis*.

But how are we to get back in the later stages to the ordinary form of larva. The embryonal centres have lost the power to develop the ordinary trophi; they can develop Gracilarian trophi, and afterwards the imaginal ones. But the ordinary ones have been eliminated, and no suitable imaginal discs to give rise to them remain. It is not possible to picture a *Phyllocnistis* giving rise to a form with a larva possessed of ordinary mouth-parts. They are gone and cannot return. Any modification of the mouth-parts of *Phyllocnistis* larvæ that are possible would probably be less like the ordinary form than they are at present, though there is no reason why a modification might not occur fulfilling very similar functions to those of the ordinary trophi, but structurally they would be decidedly different. No such forms appear to exist.

When we remember that it is the first stage that is always Gracilarian, and that it persists into the second or some further stage, and that it is useful in very small larvæ only, and therefore especially in the first stage. That later there is always an ordinary stage, though not completely so in *Phyllocnistis*, since in it—this also is modified so as to possess no jaws, and only a spinneret as an actually functional organ—the conclusion is inevitable that the Gracilarian form arose by modification in the first instar, and thence moved forward into the second, and in other cases further.

This modification in the early instars of *Gracilaria* is by no means an isolated instance of such an occurrence, but it is probably the most pronounced and the most unmistakable case in which an early larval instar undergoes modification, independently of any change in the later ones.

We are familiar with the four stages of egg, larva, pupa, and imago, and that modifications may take place in any one of these, without any corresponding change necessarily occurring in any of the others. And we are tolerably prepared to find

changes in full-grown larvæ gradually pushing their way back to the earlier instars. What we learn here, however, is that each larval instar is a stage, comparable to the pupal or imaginal stage in its individual importance, and that it may undergo changes without necessarily involving any other instar, which holds to it the attitude of a separate stage.

In the larval state there are no doubt two conditions at work; the one is the tendency of a peculiarity acquired at any stage to be passed to the preceding and following stages—a tendency that will gradually produce an effect on these adjacent stages unless they resist it. This they will do should the peculiarity be such as to produce harmful effects if passed on to them. The other condition is that the full-grown larva has usually to adapt itself to conditions that are much more various than those affecting the young larva, and so the adult larva is much more liable to varied specialization than it is in its earlier instars.

Essentially, nevertheless, the young larva is just as liable to specialize in view of changed conditions as the adult one is.

This consideration, if we could always keep it in view, especially if we could recognize and understand the cases in which it occurs, would often assist us very much in overcoming difficulties that arise from supposing that young larvæ are always less modified than older ones; and especially that such modifications as they present are reminiscences of modifications acquired by the adult larvæ of some or other of their ancestors.

As a possible instance, I may remind you of the young larva of *Papilio machaon*. This larva seems obviously reminiscent of an adult *Vanessa* larva. Yet it is certain that, whether *Vanessa* be or be not derived from a *Papilio*-like form, *Papilio* is certainly not derived from any Nymphalid, nor is there any probability that any adult *Papilio* larva ever was spinous in precisely this manner.

The spines are a special development of the young *Papilio* larva for protective objects affecting itself. They have not been derived from spinous full-grown larvæ amongst their ancestors, and are not passed on to the present adult larva because it does not require them.

The processes on adult larvæ of *Ornithoptera* and of *Clytia* are not spinous, so as to be ancestral to those of young *Machaon*, but may themselves be derived from the spines of the first stage.

As I have said, however, this and other instances are open to some doubt, and the case of *Gracilaria*, in which doubt is difficult to insinuate, is useful, as giving us a standpoint different from that usually held.

(To be continued.)

VARIATION IN THE GENUS *EREBIA*.

By GEOFFREY SMITH.

(Concluded from p. 71.)

E. tyndarus (measurement of fore wings from apex to insertion in thorax; male and female variable. Proportion of females, 25 per cent.)—

Range in males . . . 15 mm. to 19 mm.

Range in females . . . 16 mm. to 19 mm.

These measurements are from fifty individuals collected in a confined area in Haute-Savoie. The males fell into a normal scheme, thus :—

3 per cent. measured under 16 mm.				
19	„	„	„	17 „
45	„	„	„	18 „
30	„	„	„	19 „
3	„	„	„	20 „

This is opposed to the theory, but the following considerations afford a possible explanation. From the specimens I possess I am strongly inclined to believe that the larger individuals of both sexes occur earlier in the year, and graduate down to the smaller as the season advances. By this means the variations are kept separate and constant in proportion, despite the disparity in number of the sexes, just as the numerical relations between so many distinct unvarying species would be kept unchanged from generation to generation, unless some outside influence, *e.g.* natural selection, disturbed those relations. From the variations being thus kept separate, the character of length of fore wing may be considered as a constant one from our point of view. We possibly see here a case of incipient seasonal dimorphism.

E. melampus (spot-power : male variable, female more or less constant at 7. Proportion of female about 10 per cent.).

In order to economise space, I will condense the remarks on this species.

The scheme derived from males of very different areas was normal, and gave a M of $6\frac{1}{3}$.

The scheme derived from males collected by myself in a confined area was abnormal; M was 5. The M of var. *sudetica* male is about 7.

E. ligea-euryale (spot-power : male and female variable. Proportion of female about 20 per cent.). The questions relating to the specific distinctness of these forms are very complex. In his list of the genus *Erebia* (Trans. Ent. Soc. 1898), Mr. Elwes separates the two as good species, but names such varieties as *E. ligea* vars. *adyte* and *livonica* as transitional to *E. euryale*.

Dr. Chapman (Trans. Ent. Soc. Sept. 1898), from considerations based on the forms of the gonapophyses, states that "the two recognized forms, *ligea*, with its vars. *adyte* and *ajanensis*, and *euryale*, with var. *ocellaris*, whilst usually distinct, are not always so, and in some places intermix." From my own experience, I am inclined to believe that there is only one true species to be derived from the numerous forms included under the two names *ligea* and *euryale*—that is to say, that any of those forms are capable of intercrossing and of producing any or all of the rest. I have collected from one confined area, namely, from a somewhat isolated mountain slope above the St. Gervais valley, the following forms: *ligea* (typical, with large ocelli), *ligea* (smaller, and with ocelli replaced by black spots, identical, in my opinion, with var. *adyte*), *euryale* (typical, with small ocelli), *euryale* (only conventionally separable both by clasp-form and wing-facies from *adyte* forms of *E. ligea*), *euryale* var. *ocellaris*. I can see no valid reason for doubting that these forms are specifically one. In order to bring out the degrees of resemblances and differences that exist between the two so-called species and their varieties, I have drawn up a table showing the amounts of ocellation possessed by them respectively. In giving numerical values to ocelli and spots, I have gone on the rough principle of counting two for an ocellus and one for an unpupilled spot, but I have had to use discretion further than this. The following table is made up from the specimens in the British Museum:—

TABLE.

16	{ ligea typ. }	{ ligea }	{ euryale }	{ Swiss and Silesian Alps }	{ euryale typ. }	16	
15						15	
14						14	
13						13	
12						12	
11						11	
10						10	
9						9	
8						8	
7						7	
6	{ adyte }	{ euryale }	{ ocellaris }	{ euryaloides }	6		
5					5		
4					4		
3					3		
2	{ livonica }			{ ocellaris }	2		
1					1		
0					0		
				{ euryaloides }			

M 9½

M 8

M 6½

The facts to be deduced from this table are as follows: The whole range of variability in ocellation in the two forms taken together is from 16-0. Taken separately the two forms overlap one another at opposite extremities, the M of *ligea* being $9\frac{1}{2}$, that of *euryale* $6\frac{1}{2}$. Now, if the two are to be united into one species, the following conditions must be fulfilled—(1) the mean combined from the means of the two forms must equal the mean of the whole range of variability; (2) the combined mean should fall at a point where the two forms confessedly pass over into one another. Now, it will be seen that both these conditions are satisfied by the table, for (1) $\frac{1}{2} (9\frac{1}{2} + 6\frac{1}{2}) = 8$, and (2) 8 falls at the point round which the two forms *adyte* and *euryale* type are grouped, and it is admitted that these are transitional forms.

I cannot give here the evidence derived from clasp-forms, though, to my mind, it is even more convincing than any that can be derived from wing-facies, because it is so unfailing in its application to other species of the genus. But anyone who has worked through a series of them, as I have done, will, I think, agree with the following remark of Dr. Chapman: "The clasp differences are not great enough to render this (identity of the two species) otherwise than likely where they occur together on the same ground." That the various forms do occur together more commonly than is supposed, I can only suggest by referring back to my own remarks and the following of Mr. Elwes: "The larger the number of specimens which are brought together from many localities, the more difficult it becomes to name those varieties; and I have therefore dropped the names of a few which I had previously adopted, though I have not done so in cases where, as with many Asiatic forms, my knowledge is as yet insufficient to justify this course."

From the foregoing arguments it can easily be gathered that if we treat all forms of *ligea* and *euryale* as one species, we have here the kind of evidence that we set out to find. Collectors from different parts of the world bring back such different specimens of this species that separate varietal and even specific names are given to them; as collections from these areas become more complete, intermediate links between these varieties and species are supplied, which show that all are only one species. The explanation I would give of these facts is that a casual collector in some area meets only with the M of that area (M being the mediocre or commonest condition); it is only after long collecting in the same area that the other terms of the scheme can be supplied. Now we saw that, according to our hypothesis, the M of different areas would probably be different, and this supposition is confirmed by the number of named varieties that exist which were supposed at first to be peculiar to some particular locality. But as collections become more perfect, it is found that what occurs as an habitual variation in one area

occurs as an occasional variation or aberration in another ; in other words, the M of one area is the M + or M - of another.

We expected also to find another piece of evidence, if the principle discussed in Part I. had come into play ; and that was that the schemes derived from separate areas should not be normal. Although my material is not sufficient to ensure anything more than some degree of probability, the scheme derived from the percentages of forms occurring in a confined area is not a normal one. There is too sharp a transition in numbers from those possessing large ocelli to those with the ocelli replaced by spots.

Further additions are much needed to confirm or correct the imperfect observations here recorded, both in regard to the species treated, and also other species of this and other genera.

To recapitulate the whole discussion—the two leading characteristics of the species of the genus *Erebia* are variability and numerical disproportion of sexes. These two characteristics are put into causal connection by the principle that equality in the numbers of the sexes tends towards equilibrium, *i.e.* constancy of hitherto variable characters, and that inequality when coupled with variability in the preponderating sex tends towards continued fluctuation of variable characters. This is effected in the following ways :—

When the sexes are equal in numbers constancy of characters is attained by—

1. Regular product of variability of one sex into constancy of the other, under undisturbed regulation of the laws of chance.
2. Regular product of variability of one sex into variability of the other, under undisturbed regulation of the laws of chance.

When the sexes are unequal in numbers fluctuation is preserved by—

1. Irregular product of variability of one sex into constancy of the other, the laws of chance acting irregularly.
2. Ditto, when both sexes are variable.

The evidence of the existence of this principle as a working factor would be that the individuals of a variable species satisfying the conditions of principle, and taken from a confined area, do not fall into a normal scheme with respect to the variable characters under consideration, although individuals taken from many areas very likely do so ; and also that the M of different areas would differ both from one another, and from the M of all the areas combined. Observations were then given on *E. tyndarus*, *melampus*, and *ligea-curyale*, which tended to show that such evidence was forthcoming.

N ADDITIONAL LIST OF BUTTERFLIES FROM THE RHONE VALLEY.

By A. F. ROSA, M.B, C.M.

IN relation to a list of butterflies published by me in the *Entomologist* for February, 1900, the following are a few notes in comparison, and an additional list of species and varieties observed, during two subsequent visits of a fortnight and ten days respectively, in July (7th to 21st), 1900, and August (3rd to 13th), 1901.

On these two occasions practically the same ground was worked—*viz.* (1) the vicinity of Aigle; (2) the forest of Pfin; (3) Berisal and the Simplon route; with the exception that in August, 1901, a short stay was made at Zermatt, and the Nicolaithal traversed.

With respect to the species included in the previous list, at Aigle, in July, 1900, the first seen was *Melanargia galatea*, which did not appear whenever there was the faintest glimmer of sunshine, the first day or two being wet and almost sunless.

Things looked brighter on the 9th, and from that date onward; but butterflies were decidedly scarcer than in the previous July, especially the *Lycenidæ*. A few of *L. icarus* were noted, and of *L. corydon* and *L. damon*, which were abundant the year before, only one or two of each were seen. Wherever trees occurred by the road *Limenitis sibylla* flitted about, often in twos and threes, *L. camilla* being only represented altogether by one or two specimens; and it was the reverse the previous year as regards these two species.

Papilio machaon was frequently observed, and one was seen depositing ova on umbelliferous plants by the roadside. *Pararge assius apollo*, as usual, becomes common as one ascends the road towards Le Sepey, and amongst others I secured one very large female specimen. *Euchloë belia* var. *simplonia* and *E. cardamines* were sparingly seen, as also was *Leptidia sinapis*. *Colias heyalæ* was common, but rarely in good condition; and of *C. edusa* a fresh brood was noted, but these were few and far between. *Thecla ilicis* and *T. spini* in worse condition than in the previous year; and of the *Vanessids*, *Polygonia c-album* was taken several times, the larvæ of *Vanessa io* occurred plentifully on nettles by the side of the road near Le Sepey, and one imago of *Pyrameis statanta* was captured. The fiery *Melitæa didyma* was the commonest of its genus, which was otherwise represented by *M. phæbe* and *M. athalia*. The three large fritillaries *Argynnis aglaia*, *A. adippe*, and *A. paphia* turned up now and then; and *Satyrus permione*, much smaller than in the previous July, was abundant. *S. actæa* var. *cordula*, *Pararge mæra*, *P. megæra*, *P. achini*, and many other common butterflies, as *Aporia cratægi*, *Gonepteryx rhamni*, *Satyrus semele*, etc., were taken or noted.

In the Pfingst forest, July, 1900, butterflies at times were observed in great abundance. In the shady parts a fine brood of *Erebia ligea* was emerging, and *Lycæna arion* var. *obscura* was the same and in like condition (one of these has all the wings completely shaded). These two species were very plentiful, and so was *Argynnis latonia*, of which four or five more than once were noted within as many yards. *Limenitis camilla* here was fairly common, the difficulty being the scarcity of perfect specimens, many being chipped, although all were fresh. *L. sibylla* apparently does not occur in the forest.

In the smaller fields, especially where overrun with tall rank weeds, &c., *Papilio machaon* frequently occurred, and the larger fritillaries also frequented these hot sheltered spots, along with *Aporia crataegi*, *Gonepteryx rhamni*, *Colias hyale*, and an occasional *C. edusa*, &c.

Leptidia sinapis and its var. *erysimi* also occurred commonly, and in the larger open fields *Lycæna corydon* was about in abundance, and at times *Melitæa athalia* arose in numbers at every step. *M. phæbe* was also taken, and *Satyrus hermione*, very small, probably some referable to *S. alcyone*; and, in addition to these, *S. actæa* v. *cordula*, *Epinephele lycaon*, and many others.

On the Simplon route, in the same year, the principal feature was the abundance of the Lycænidae, not only as regards numbers, but as species and varieties, as *Lycæna ægon*, *L. argus*, *L. astrarche*, *L. eros*, *L. icarus*, *L. eumedon*, *L. bellargus*, *L. corydon*, *L. hylas*, *L. damon*, *L. minimus*, *L. semiargus*, *L. arion*, and seven other blues, which will be taken up in the list to follow.

Erebia euryale was also a conspicuous insect on account of its abundance, from above Brieg to well up the Simplon road above Berisal it was to be noted, as is its habit, congregated in little groups on the road. *Papilio machaon* was common on a steep embankment at a bend in the road above Berisal, and *Parnassius apollo* in the neighbourhood of Berisal. *Pieris callidice*, *P. napi* var. *bryoniae*, and *Colias phicomone* were taken at and near the top of the Simplon, and *Cænonympha arcania* var. *darwiniana* on the Italian side.

Near Brieg *Colias edusa* was a passing and generally rapidly disappearing visitor, and below Berisal *C. hyale*, *Gonepteryx rhamni*, *Melitæa phæbe* (very common and varied), *M. didyma*, *M. athalia*; the larger fritillaries, *Argynnis aglaia*, *A. adippe*, and *A. niobe* (mostly var. *eris*), also *A. euphrosyne* and *A. pales*. *Chrysophanus virgaureæ*, *C. hippothoë*, *C. alciphron* var. *gordius*, near Berisal; and among the skippers, which were very common, *Carcharodus (Syrichthus) lavateræ* was frequently taken. *Melitæa dictynna* also occurred above Berisal, and, higher up, *Erebia tyndarus* and *E. melampus*.

In August, 1901, in those different districts, being a month later, I naturally expected to find many new things, but these anticipations were not realized, very few new species were observed. Many had disappeared, many still lingered on the wing, and a few were represented in their later broods, as *Colias hyale*, *Pararge megæra*, &c., in the Pfin Forest. *Pieris brassicae* was much more common and generally distributed than I had previously observed it; and on the Simplon, *Erebia goante* was very plentiful, as also was *Pieris callidice* in the neighbourhood of the Schwarzee, on the Matterhorn.

The undernoted are the additional species and varieties taken or seen during these two seasons:—

PAPILIONIDÆ.

Papilio podalirius.—This species, which, as above indicated, was not seen in 1899, although assiduously looked for, was sparingly seen and taken on the road between Aigle and Le Sepey in early July, 1900, and also a few days later in the Pfin Forest. In August last it was very common in the latter locality, far more common than *P. machaon*. One white example of *P. podalirius* was taken at Aigle, July, 1900; and another, a fine specimen, was secured in the forest in August, 1901.

P. machaon var. *aurantiaca*.—One of this variety netted on the Simplon route above Berisal, and one or two others seen in the Pfin Forest, July, 1900.

Parnassius apollo var. *pseudonomion*.—One male near Aigle on the Le Sepey road in 1900.

P. mnemosyne.—Common in a field below Berisal from 15th to 18th July, 1900, the males being mostly worn and scarce; but the females were not difficult at this late date to obtain in good condition.

PIERIDÆ.

Pieris daphidice.—A few captured in the Pfin Forest in July, 1900, and in August, 1901, it was to be taken freely; a fine brood, nearly all in splendid condition, in the same locality.

Leptidia sinapis var. *diniensis*.—Common in the Pfin Forest last August.

Colias palæno.—Occasionally on the top of the Simplon and at the Ganter Bridge below Berisal in July, 1900. Also one pale male taken in the Pfin Forest the same year, which I believe is a low elevation for it in Switzerland.

LYCÆNIDÆ.

Zephyrus quercus.—One netted near Aigle in July, 1900.

Chrysophanus virgaureæ var. *zermattensis*.—Common by the side of the road at Berisal, and frequently at Zermatt, and in a field in the Zmutt Thal, August, 1901.

Lycæna argus var. *agidion*.—One of this blue variety of the female taken at Visp, and another near Loèche in August last.

L. zephyrus var. *lycidas*.—Between the second refuge and the Ganter Bridge on the Simplon road, which I believe is the best locality for it, I secured a series of this interesting blue between the 15th and 18th July, 1900, and probably more would have been taken

had it not been the case that *L. escheri* was in great profusion, and being of a more brilliant colour distracted one's attention.

L. baton.—Two at Berisal, July, 1900.

L. pheretes.—One in the Ganter-Thal, July, 1900.

L. orbitulus.—Fairly common in the same locality as last, and at the same time.

L. icarus ab. *icarinus*.—Occasionally at Berisal, July, 1900.

L. escheri.—As before mentioned, this species was in grand form between Brieg and Berisal, and especially abundant on nearing the latter locality, July, 1900. Also one large male taken in the Pfywald, and a few in 1901.

L. meleager.—I accompanied a friend to the Pfin Forest who was in search of this insect in July, 1900; we did not identify the species until our return to the hotel, although we had both secured specimens. Its resemblance to *L. corydon* is at first sight very close, although the next day I had little difficulty in distinguishing it on the wing. It was apparently fairly common, and in August, 1901, although a month later in the season, the insect was still on the wing; the males were, however, rather worn, but not so badly as one would have expected.—*Ab. steveni*. The females taken are apparently of this form.

L. corydon var. *corydonius*.—One of this beautiful variety taken at Pfin, July, 1900.

L. alcon.—One male beyond the Hospice on the Simplon Pass, July, 1900.

NYMPHALIDÆ.

Apatura iris.—Other butterflies, especially the Lycænidæ, being comparatively scarce at Aigle in July, 1900, the presence of this fine species on the road contributed greatly to compensate for the deficiency. All those seen were males, and being very bold were frequently easily captured. Seven were seen in one morning, and of these four were taken; and on other days in smaller numbers. Only observed each day from about the time the sun struck the road (10 a.m. or later) till about noon. Generally settled on the dry white rock at the side of the road, or on the road itself. Only once on mule droppings, which were more frequently visited by *Satyrus hermine* and *Melitæa didyma*.

A. ilia.—The first strange butterfly seen in the Pfin Forest, July, 1900, was this, and the individual seemed to have an attraction for a special spot in a dry ditch, to which it returned several times after taking long flights. I eventually captured it later on in the day as it alighted on the leaves of a shrub. The species was not particularly common, three or four being the total catch—all males.

Limenitis populi.—Seen on three occasions in the Pfin Forest, July, 1900.

Polygonia c-album var. *hutchinsonii*.—One taken in the Nicolai-Thal, near Stalden, last August.

Vanessa antiopa.—One seen circling round near the top of some lofty trees at Aigle, and one worn specimen at rest on a wall near Brieg Station, July, 1900. Again at Aigle in August last, and not infrequently on the road between Loèche and Pfin.

Pyrameis cardui.—One or two in the Pfywald, July, 1900; and in August, 1901, taken commonly in the same neighbourhood. Some of

hem very diminutive, all freshly emerged, and frequently very richly coloured.

Melitæa didyma var. *alpina*.—Seen first on a wall at Aigle, and taken on the road to Berisal. Again taken last season at Aigle and Berisal.

M. phæbe var. *occitanica*.—Near Berisal, July, 1900; also var. *minor*.

Argynnis paphia var. *valesina*.—Stalden, Visp, and Aigle, August, 1901.

A. selene.—Several above Brieg, July, 1900.

A. dia.—Common in the Pfynwald last August; also one taken near Zermatt on the path to Staffel Alp.

SATYRIDÆ.

Erebia epiphron var. *cassiope*.—One on the Simplon above Berisal, July, 1900.—Var. *valesiana*. Two on the Matterhorn, August, 1901.

E. mnestra.—Two specimens on the Matterhorn, August, 1901.

E. æthiops.—Pfynwald, very large specimens; and one female of the var. *leucotania*, August, 1901.

E. euryale ab. *adyte*.—Many specimens of *euryale* taken on the Simplon, July, 1900, were of this form.

Satyrus dryas.—Sparingly at Aigle; but common in the Pfyn Forest last season.

Pararge egeria.—One at Pfin, August, 1901.

HESPERIIDÆ.

Augiades (Hesperia) comma.—Occurred in the Pfynwald last August.

Altogether during the three seasons about one hundred and forty-four species and named varieties were observed, and taken, with the exception of *Limenitis populi*.

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A FEW NOTES ON SOME OF THE BUTTERFLIES OF SYRIA AND PALESTINE.

BY MARGARET E. FOUNTAINE, F.E.S.

(Concluded from p. 63.)

Lycæna balcanica, Fr. —This exquisite little "blue" occurred during the last days of June in great abundance on the shores of the Sea of Galilee, and in other localities, always at low levels in Palestine; also on the Plain of Hûleh, below Bâniyâs. I generally found it flying round a small-leaved, prickly shrub, which grew in clumps in all these places.

L. gamra, Ld. —The butterfly, identified by Mr. Elwes as *L. gamra*, which I only met with in Palestine, was first seen by me just above the Sea of Galilee, but not found, like *balcanica*, down on the very brink of the lake. On the Plain of Jenîn, on July 3rd, when I was riding from Nazareth to the next halting-place, it literally swarmed; some of the specimens were in perfect condition, others not so fresh, so that I

would rather suggest the end of June as the time of appearance for this butterfly than the beginning of July.

L. trochylus, Frr.—Common round Beyrout and other places, at low levels, from May on throughout the summer. I do not recollect ever seeing it in Palestine.

L. galba, Chr.—Occurring at the same time in all the same localities as *gamra*.

L. lysimon, Hüb.—Only found by me on the Plain of Hûleh, near Bâniyâs, and nowhere else. *L. galba*, to which it bears a striking resemblance, did not occur in the same place.

L. loewii, Z.—I found these butterflies flying in some considerable numbers near Damascus, on a mountain rising immediately behind the Kurd village, the parched-up aridity of which baffles all description, being also more especially remarkable in contrast to the rich, fertile plain, where the white city of Damascus lies surrounded by gardens intersected with streams and watercourses. But, unfortunately, on the 8th of May and succeeding days upon which I visited this mountain, it was only with the greatest difficulty that I succeeded in taking any specimens of *loewii* worth keeping; the females especially were in very bad condition. I also took one male of this butterfly at Baalbek in June, but saw no others.

L. zephyrus var. *nicholli*.—I was particularly interested to take this variety, named after and discovered only a year ago by Mrs. Nicholl. At Baalbek, though I searched everywhere, I neither found the variety or the type; but at the Cedars, the first week in June, I was more fortunate, and took some remarkably well-marked specimens of var. *nicholli*.

L. anteros var. *crassipuncta*, Christoph.—I took a good series of this butterfly, mostly at the B'hamdoon Cedars, near Ain Zahalta, in April; also a few specimens, including one female from Bsherreh in June.

L. isaurica, Ld.—At the Cedars, males only, in June.

L. bellargus var. *polonus*, Z. (?).—This variety was fairly common in the dried-up bed of a stream, on the way to the Cedars from Bsherreh in June; the females, however, were rare, and I only took two specimens. In calling it *polonus* I am submitting to the superior knowledge of Mr. Elwes and Mrs. Nicholl, for it seems to me to approach much more nearly to *corydon* than *bellargus*, and to answer exactly to the description of var. *corydonius*, H. S.

L. admetus var. *ripartii*, Frr.—Common in the neighbourhood of Bsherreh and the Cedars in June.

L. poscidon, Ld.—I took several specimens of this species, at Baalbek, the Cedars, &c.; I cannot think it is a variety of *damon*, the males are so remarkably dissimilar, both sexes bearing a very striking resemblance to *damon* females. I should be interested to know if this is a distinct species or not.

L. semiargus var. *antiochena*, Ld.—Common near Maharain, in the neighbourhood of Ain Zahalta, in April; the females, which were much rarer than the males, were extremely beautiful, being shot with vivid blue on all the wings, in addition to the broad orange border. All the males had minute orange spots on the hind wings, near the anal angles on the upper side; more distinct, and on all the wings.

beneath, in both sexes. I could not trace much resemblance to *semiargus* in either sex, either in size, shape, or colour.

Vanessa egea, Cr.—Common in most places, at no great elevation; a large, bright form. I do not recollect ever having seen such large specimens anywhere in Europe.

V. urticae var. *turcica*, Stgr.—Having found a quantity of "lesser tortoiseshell" caterpillars feeding, as usual, on nettles, on the southern slopes of the Jebel-el-Arz, at an elevation of some 7000 ft., on June 11th, I took about two dozen of the largest I could find. They all pupated in a few days, and in less than a week emerged into perfect insects, all more or less belonging to the var. *turcica*, and some very markedly so. Possibly the intense heat of Damascus, which place I had moved on to, was partly accountable for their very rapid emergence.

(*Melitæa*, F.—I have not been able to identify the species I took of this genus with sufficient certainty to give any satisfactory account of them. A series from Ain Zahalta, in April, I believe to be *M. arduinna*, Esp., but I am by no means certain of their identity. I certainly took a magnificent form of *M. didyma* var. *ncera*, on a high mountain near Damascus, in May and, less decided, in a few other places.)

Argynnis niobe var. *eris*, Meig.—One every small specimen at the Cedars in June; black tracery above extremely scanty. I saw others.

A. pandora, S.V.—Common in several places. I saw one at Ain Zahalta on April 28th; was not this very early?

Danaïs chrysippus, L.—Fairly common on the Plain of Hûleh, round Beyrout, &c.; I should say, on the wing throughout the summer.

Melanargia titea, Klug.—At the mouth of the Dog River, and at Hadet, near Beyrout, throughout the month of May. It was on May 14th that I first saw one specimen up the Dog River, but unluckily I did not visit its particular haunt at the mouth of the river that day, which Prof. Day had kindly pointed out to me on a previous occasion; and when I did visit it, a week or two later, all the specimens were worn.

M. teneates, Mén.—Like Mrs. Nicholl, I also mistook this butterfly for *M. larissa* var. *herta*, when I first saw it, on the top of a mountain near Damascus, in May. It seemed to occur on all the high mountains throughout the summer, apparently producing a succession of broods, as fresh specimens were always to be met with, as well as others in as bad condition as they well could be. Perhaps it was most common on the comparatively lower regions of Mt. Hermon, towards the end of June; but, unlike most of this genus, instead of colonizing groups in certain localities, it was widely distributed, and specimens generally occurred singly.

Satyrus anthe, O.—Abundant everywhere in the Lebanon and Anti-Lebanon; throughout the greater part of May and June; I do not recollect seeing it anywhere in July, or at all in Palestine. At the foot of a mountain near Damascus, on May 10th, it was freshly emerging in the early morning, and I took a number of specimens only just out of the chrysalis, with their wings still limp. The var. *hanifa* occurred everywhere with the type; this variety seemed to be confined to the females, though I took one male at Damascus very nearly approaching it in richness of tone.

S. pelopea, Klug.—Not out much before June, and very considerably less plentiful than the preceding, or the next species.

S. telephassa, Hüb.—Very common indeed; I should say it was out some eight or ten days earlier than *anthe* this year, but might vary according to the season. To me it appears quite distinct from *S. amalthea*, which I took some numbers of in Greece last year. The females were quite as common as the males, and this was also the case with *amalthea*.

S. stalilinus var. *sichæa*, Ld.—This variety was common in mountain gorges and ravines in Palestine early in July. I also took it near Beyrout, and at Alèy later in the month.

Ypthima asterope, Klug.—This little brown butterfly was common on the coast from April till August, and probably on till the autumn, evidently producing a succession of broods throughout the summer. I did not think it interesting; none of the specimens ever presented the slightest variation, being almost identical.

Pararge roxelana, Cr.—Not uncommon, and in excellent condition, near Bludân on June 20th. It flew in shady, narrow lanes. The specimens did not vary with those I have taken in Hungary, only in the extraordinary development of the hind wings from costa to outer margin.

Epinephele lycaon, Rott.—All along the lower slopes of Mount Hermon on June 28th. The specimens struck me as being paler in tone than the European form; indeed, the first male I saw I mistook for a large pale-coloured *Lycæna*.

E. ianira var. *telmessia*, Z.—In the grounds of the American College and other places near Beyrout in April and May. I found the female rare and difficult to secure a good series of.

Syrichthus tessellum var. *nomas*.—A very fine "skipper." I took single specimens in various localities in the Lebanon in May and June.

S. malva var. *melotis*, Dup.—Common in the Lebanon, May and June.

S. poggei, Ld.—On the top of a mountain near Damascus; fairly common early in May.

S. orbifer, Hüb.—Very common in many places in April and May.

Nisoniades marloji, B.—I took one specimen and saw another near Ain Zahalta in April.

Hesperia nostrodamus, F.—I used to see this butterfly up the Dor River, &c., but never succeeded in getting a specimen worth keeping. I imagine, like most "black butterflies," it gets rubbed very easily.

Before concluding these notes, it may perhaps be of some use to other entomologists intending to visit Syria to mention some of the localities I found the best for collecting, with perhaps a few observations of a practical nature as well. Of these, I select three especially, *viz.* Ain Zahalta, Bsherreh, for the neighbourhood of the Cedars, and Bâniyâs, at the foot of the southern slopes of Mount Hermon. Ain Zahalta, which is reached by a four hours' walk over the mountains from Ain Sôfar, on the Beyrout-Damascus Railway, is a mission station, and accom-

accommodation—clean but rough—can be obtained during the spring months (which I should imagine was the best time for collecting here) at the house of a Syrian woman named Takla Abood, who speaks English; and in summer there is a mountain hotel. At Basherreh, about one hour's walk or ride from the Cedars, situated in a magnificent position overlooking a glorious well-watered valley, there is now a new hotel, very small but most clean and comfortable, with the most obliging host and hostess, both of whom, having spent some time in Australia, can speak English. Basherreh is approached on the west by a carriage-road, and is two days' drive from Beyrout by Tripolis; or, on the east over the pass of the Jebel-el-Arz, about ten or twelve hours' ride from Haikalbek, with good collecting most of the way. At Bâniyâs I could willingly have made a much more protracted stay, as from what I did see I should say it was one of the best "butterfly corners" in Syria; but I only passed it as one of the halting-places on my ride from Damascus to Jerusalem, and not being provided with tents, the accommodation in the native house where I put up was of such a nature that my courage failed me at the thoughts of another night in Bâniyâs, so I decided to ride on to Giayoni. But I feel sure that for those who should be camping out, and therefore independent of the horrors of native houses, this neighbourhood would afford excellent collecting.

7, Lansdown Place (East), Bath: Dec. 1901.

LIST OF LEPIDOPTERA COLLECTED BY DR. CUTHBERT CHRISTY IN NIGERIA.

BY EMILY MARY SHARPE.

(Concluded from p. 68.)

Family LYCÆNIDÆ.

46. LACHNOCNEMA D'URBANI, *Trimen*.—*a*. Jebba; May.
 47. PILODEUDORIX CÆRULEA (*H. H. Druce*).—*a*, *b*, ♂. Juju-rock, Jebba; November.
 48. VIRACHOLA LIVIA (*Klug*).—*a*. Juju-rock, Jebba; November. This species was hitherto supposed to be restricted to Aden, hence there are specimens in the British Museum.
 49. VIRACHOLA ANTALUS (*Hopff*).—*a-c*, ♂. Juju-rock, Jebba; November. *d*, ♀. Lokoja; May.
 50. SUKIDION IASIS (*Hewits*).—*a*, ♂. Juju-rock, Jebba; November.
- "*Pilodeudorix cærulea*, *Virachola livia*, and *Sukidion iasis* seem to frequent high ground, as I only came across these species on the Juju-rock."—C. C.

51. *SPINDASIS NILUS* (Hewits.).—*a*, ♂. Ilo; February, 1899.

This is a very interesting species, hitherto represented by a female in the Hewitson Collection in the British Museum from the White Nile.

52. *AXIOCERSES PERION* (Cram.).—*a*, *b*, ♂. Ilo; January. *c*, ♀. Lokoja; May. *d-f*, ♂. Ilo; March, 1899.

53. *LYCÆNESTHES AMARAH* (Guér.).—*a*, ♀. Ilo; January, 1899.

54. *LYCÆNESTHES ADHERBAL*, Mabille.—*a*, ♂. Lokoja; May.

55. *LYCÆNESTHES LARYDAS* (Cram.).—*a*, ♂. Lokoja.

56. *CACYREUS LINGEUS* (Cram.).—*a-c*, ♂. Jebba; September, 1898.

57. *TARUCUS PLINIUS* (Fabr.).—*a-d*, ♂. Jebba; May, September, November, 1898. *e*, ♀. Sierra Leone; February, 1898. *f-i*, ♂. Rabba; November.

58. *POLYOMMATUS BÆTICUS* (Linn.).—*a*, *e*, ♂ ♀. Jebba; November. *f*, ♂. Boussa; December. *g*, ♂. Rabba; November.

59. *CATOCHRYSOPS FUMOSUS*, Butl.—*a*. Lokoja.

60. *CATOCHRYSOPS OSIRIS* (Hopff.).—*a*, ♂. Leaba; December, 1899. *b*, ♂. Shonga; August.

61. *EUCHRYSOPS NIGERIÆ*, sp. n.—Primaries: General colour bright azure blue; the apex and hind margin narrowly lined with greyish brown; cilia dirty white. Secondaries similar to the primaries; the hind margin narrowly edged with greyish brown, the cilia nearly white; a submarginal row of white spots with more or less obsolete dark centres, the darkest and largest spot situated between the first and second median nervule; near the anal angle a second row of faintly indicated white spots. Underside similar to that of *Catochrysops contracta*, Butler. An extra row of spots on the marginal area of both wings, these spots being larger and more compact than in the above-named form, and consisting of four narrow lines of brown, with white spots on either side situated between the nervules; the basal area of the secondaries relieved by the usual three black dots; the distinct black spot on the hind margin edged on its lower side with metallic silver; one spot between the second and third median nervule and two spots on the anal angle being of the same metallic colour. Expanse, .8 in.

Hab. ♂. Ilo; February, 1899. Type.

62. *LAMPIDES HIPPOCRATES* (Fabr.).—*a*, *b*. Jebba; September, 1899.

63. *NEOLYCÆNA CISSUS* (Godt.).—*a-c*, ♂. Shonga; August. *f*, ♀. Jebba; November.

64. *ZIZERA KNYSNA* (Trimen).—*a-d*, ♂ ♀. Jebba; September and October.

Family PIERIDÆ.

65. NYCHITOMA ALCESTA (*Cram.*).—*a, b*. Jebba ; May, October.
c. Lokoja.
66. MYLOTHRIS CHLORIS (*Fabr.*).—*a*, ♂. Shonga ; September.
67. PHRISSURA SYLVIA (*Fabr.*).—*a*. Mount Patti, Lokoja ; May, 1899.
68. GLUTOPHRISSA SABA (*Fabr.*).—*a-d*, ♂. Jebba ; May, October.
e-g, ♂ ♀. Mount Patti, Lokoja ; May, 1899. *h*, ♂. Boussa ; December.
69. BELENOIS GIDICA (*Godt.*).—*a*, ♂. Jebba ; May.
70. BELENOIS ABYSSINICUS (*Lucas*).—*a*, ♂. Ilo ; January, 1899.
71. BELENOIS CREONA (*Cram.*).—*a-i*, ♂ ♀. Ilo ; March, 1899.
j, ♂. Rabba ; November. *k-m*, ♂ ♀. Jebba ; September, 1898.
n-r, ♂ ♀. Mount Patti, Lokoja ; May, 1899. *s*, ♂. Lokoja ; May. *t*, ♀. Juju-rock, Jebba ; November.
72. BELENOIS MESENTINA (*Cram.*).—*a, b*, ♂. Ilo ; March. *c*, ♂. Rabba ; November.
73. BELENOIS CALYPSO (*Drury*).—*a-c*, ♂ ♀. Ilo ; March, 1899.
d, ♀. Lokoja ; May.
74. PINACOPTERYX ? LILIANA (*Grose Smith*).—*a*, ♀. Ilo ; February, 1899.
75. TERACOLUS MAIMUNA (*Kirby*). *Teracolus maimuna*, E. M. Sharpe, Monogr. Ent. i. p. 24, pl. 9, figs. 1-19 (1898).—*a*, ♂. Jebba ; September, 1898.
76. TERACOLUS AMELIA (*Lucas*).—*a, b*. Ilo ; February and March, 1899.
- This species has been recorded from Senegal and Abyssinia, and seems therefore to range throughout the Soudan.
77. TERACOLUS DEDECORA (*Feld.*).—*a-i*, ♂ ♀. Ilo ; January, February, 1899.
- The occurrence of this species in Nigeria is of great interest, as it has previously only been recorded from Senegal, in Western Africa. It is a well-known species in North-eastern Africa, where it ranges from Abyssinia to Somali-land, and eastward as far as Muscat, in Arabia.
78. TERACOLUS EVIPPE (*Linn.*).—*a-l*, ♂ ♀. Jebba ; September, November, 1898. *m*, ♂. Ilo ; March, 1899. *n, o*, ♂ ♀. Mount Patti, Lokoja ; May. *p-s*, ♂ ♀. Lokoja ; May.
79. TERACOLUS LOANDICUS, *Butl.*.—*a*. Lokoja ; May.
80. TERACOLUS EVAGORE (*Klug*).—*a-e*, ♂ ♀. Ilo ; January, February, 1899.
- I am unable to separate Dr. Christy's specimens from those in the British Museum from Aden, from which place the British Museum contains a large series.
81. TERACOLUS ISAURA (*Lucas*).—*a-c*, ♂. Jebba ; September and November, 1898.

This eastern species is here recorded for the first time from Nigeria. The British Museum has specimens from the White Nile and Upper Egypt, Abyssinia, and the Arusa Galla country and Mombasa.

82. *TERACOLUS SIMPLEX*, *Butl.*—*a-d*, ♂ ♀. Ilo; February and March, 1899.

The occurrence of this southern species is somewhat extraordinary, but my father tells me that in the Hinterland of the Gold Coast some South African species of birds, which have not been found in the intervening districts of Africa, occur quite unexpectedly.

83. *TERACOLUS XANTHEVARNE*, *Butl.*; E. M. Sharpe, *Monogr. Ent.* p. 90, pl. 29, figs. 1-11 (1900).—*a, b*, ♂ ♀. Ilo; January, February, 1899.

This species has hitherto only been known from North-east Africa; the specimens in the British Museum being from the Anseba Valley, Bogos-land, Abyssinia, and the White Nile.

84. *LEUCERONIA ARGIA* (*Fabr.*).—*a*, ♂. Mozum, Benue River; June, 1899.

85. *LEUCERONIA PHARIS* (*Boisd.*).—*a-c*, ♂ ♀. Mozum, Benue River; June, 1899.

86. *CATOPSILIA FLORELLA* (*Fabr.*).—*a*, ♂. Ilo; January, 1899. *b-f*, ♂. Mount Patti, Lokoja; May, 1899.

87. *TERIAS BRENDA*, *Doubl. & Hewits.*—*a*. Mozum, Benue River; June, 1899.

88. *TERIAS ORIENTIS*, *Butl.*—*a*. Sierra Leone; February, 1898. *b, c*. Jebba; September, 1899. *d, e*. Ilo; March, 1899.

89. *TERIAS HAPALE*, *Mabille.*—*a*. Ilo; January, 1899. *b*. Boussa; December.

90. *TERIAS REGULARIS*, *Butl.*—*a-c*. Jebba; September and October, 1899. *d-f*. Shonga; August.

91. *TERIAS BRIGITTA* (*Cram.*).—*a, b*. Sierra Leone; February, 1898. *c*. Jebba; October. *d-j*. Ilo; January, February, and March, 1899.

92. *TERIAS ZOE*, *Hopff.*—*a-c*, ♂ ♀. Jebba; September and October, 1898. *f*, ♂. Rabba; November.

Family PAPILIONIDÆ.

93. *PAPILIO DEMODOCUS*, *Esper.*—*a-f*. Lokoja; May. *g-k*. Mount Patti, Lokoja; May, 1899. *l, m*. Ilo; February, 1899.

"Frequented a species of orange tree."—C. C.

94. *PAPILIO PYLADES*, *Fabr.*—*a-c*. Jebba; May and November. *d*. Rabba; November. *e*. Ilo; March, 1899. *f*. Mount Patti, Lokoja; May, 1899.

95. *PAPILIO LEONIDAS*, *Fabr.*—*a*. Lokoja; May. *b*. Mozum, Benue River; June, 1899.

Family HESPERIDÆ.

96. SARANGESA SYNESTALMENUS (*Karsch*).—*a, b*. Boussa ; December.
97. HESPERIA DROMUS (*Ploëtz*).—*a-c*, ♂ ♀. Shonga ; August.
98. PARDALEODES INCERTA (*Snellen*).—*a*. Sierra Leone ; February, 1898. *b, c*. Lokoja ; May.
99. AMPITTIA ? INORNATUS (*Trimen*).—*a*. Shonga ; August.
100. GEGENES HOTTENTOTA (*Latr.*).—*a*, ♂. Boussa ; December.
101. GEGENES LETTERSTEDTI (*Wallengr.*).—*a*. Shonga ; August, 1898.
102. PARNARA BORBONICA (*Boisd.*).—*a*. Jebba ; November.
103. BAORIS FATUELLUS (*Hopff.*).—*a*. Sierra Leone ; February, 1898. *b-f*. Jebba ; October and November. *g-h*. Lokoja ; May.
- . Rabba ; November.
- "This species has the peculiar habit of frequenting one's tent at dawn of day. It flits about in every corner in a restless manner, and is easy to catch. When the sun gets well up it disappears. It was common every morning on Mount Patti, and also at Boussa, in the hospital, flitting about beneath the beds and elsewhere."—C. C.
104. BAORIS NETOPHA (*Hewits.*).—*a*. Lokoja.
105. PLATYLESCHES BATANGÆ (*Holl.*).—*a, b*. Lokoja ; May.
106. RHOPALOCAMPTA FORESTAN (*Cram.*).—*a*. Jebba ; September. *b-g*. Lokoja ; May.

Family SPHINGIDÆ.

107. PSEUDOSMERINTHUS SUBMARGINALIS (*Walk.*).—*a*. Jebba ; November.
108. LEUCOPHLEBIA AFRA.—*Leucophlebia afra* (*Karsch*), Ent. Nach. Berlin, xvii. p. 2, pl. 1, fig. 1 (1891). *a*. Ilo ; February, 1899.
109. NEPHELE PENEUS (*Cram.*).—*a*. Jebba.

Family SYNTOMIDÆ.

110. SYNTOMIS INTERNIPLAGA (*Mabille*).—Hampson, Cat. Lepid. Phalænæ, vol. i. p. 114, pl. 11, fig. 16 (1898). *a*. Lokoja.

Family ARCTIADÆ.

111. ALPENUS ÆQUALIS (*Walk.*).—*a*. Mozum, Benue River ; June, 1899.
112. DIACRISIA LUTESCENS (*Walk.*).—Hampson, Cat. Lepid. Phalænæ, iii. p. 295, 1901. *a*. Mount Patti, Lokoja ; May, 1899. *b*. Lokoja.

113. UTETHEISA PULCHELLA (*Linn.*).—*a*. Jebba ; October, 1898.

Family HYPSIDÆ.

114. ARGINA CINGULIFERA (*Walk.*).—*a, b*. Jebba ; November. Shonga ; August, 1898.

Family LIPARIDÆ.

115. *LÆLIA SETINOIDES* (Holland).—*a*. Lokoja.

Family LYMANTRIADÆ.

116. *CIMOLA ELEUTERIA* (Stoll.).—*a-c*, ♂ ♀. Mozum, Benue River; June, 1899.

"This species was seen frequently whilst traversing the thickest jungle on the right bank of the Benue."—C. C.

117. *DASYCHIRA* sp.—*a*. Mount Patti, Lokoja; May, 1899.

118. *DASYCHIRA REMOTA* (Druce).—*a, b*. Lokoja; December, 1899.

Family LIMACODIDÆ.

119. *PARASA URDA* (Druce).—*a*. Mount Patti, Lokoja; May, 1899.

120. *CHILENA* sp.—*a, b*. Ilo; January and March, 1899.

Family NOTODONTIDÆ.

121. *ZANA* sp.—*a*. Mount Patti, Lokoja; May, 1899.

Family SATURNIIDÆ.

122. *BURNEA CHRISTYI*, E. M. Sharpe, Ann. & Mag. Nat. Hist. (7) iii. p. 371 (1899). ? *Burnea phædusa* (Drury), Walk. Lepid. Heter. v. p. 1229 (1855).—*a*. Jebba.

Sir George Hampson considers my *B. christyi* to be a variation of *B. phædusa*, Drury. As, however, there is another specimen in the British Museum from Nigeria, which agrees with my type in having the large ocelli on the fore wing, I think it is quite probable that the two species are distinct.

123. *BRUNEA PYGMÆA*, Maassen, Beiträge zur Schmett. f. 100. *Nudaurelia jebbae*, E. M. Sharpe, Ann. & Mag. Nat. Hist. (7) iii. p. 372 (1899).—*a*. Jebba; October, 1898.

124. *SALASSA MAIA* (Klug).—*a*. Jebba.

125. *HENUCHA SMILAX* (Westw.).—*a*. Jebba; November.

Family LASIOCAMPIDÆ.

126. *METANASTRIA* ? *CONTRARIA* (Walk.).—*a*. Jebba; November.

127. *GONOMETA CHRISTYI*, sp. n.—Primaries: Ground colour reddish buff, somewhat paler in colour on the hind margin; two transverse bands of a darker tint across the centre of the wing, the basal line proceeding straight from the costa to the inner margin. Secondaries: Yellowish buff with a satiny appearance, rather deeper in colour along the inner margin and the base. Under side: General colour reddish buff, the secondaries paler, especially on the hind margin. Head, antennæ, thorax, and body reddish buff. Expanse of male, 3·6 in.

Hab. Jebba; November.

Female.—Primaries bright reddish buff, with three darker transverse lines, the two basal lines being only slightly waved; a faint suffusion of grey along the inner margin, and extending over the discal area to the costa. Secondaries lighter in colour than the primaries, and with a satiny gloss. Under side similar to that of the male; the hind marginal area of the secondaries lighter in colour than the ground colour; both wings devoid of any spots or lines. Head, antennæ, thorax, and body reddish buff, the latter having a distinct gloss. Expanse, 5.6 in.

Hab. Jebba; November.

"The cocoons of this species were frequently seen on some of the largest trees growing near the river bank at Jebba, not far from the Juju-rock. They were usually placed in a cluster on the under surface of a large bough. The caterpillar, an enormous woolly bear, which I always associated with these cocoons, was on several occasions brought to me in camp. Its colour was dark reddish brown, much darker than the colour of the dead hair woven into the cocoons."—C. C.

Family COSSIDÆ.

128. *AZYGOPHLEPS INCLUSA* (Walk.).—*a.* Jebba; November.

Family NOCTUIDÆ.

129. *SPHINGOMORPHA MONTEIRONIS* (Butl.).—*a-e.* Jebba; May.
 130. *CYLIGRAMMA LIMACINA* (Guér.).—*a, b.* Lokoja, 11,000 ft. above the river; May.
 131. *OPHISMA INDICABILIS* (Walk.).—*a.* Lokoja; May.
 132. *OPHIUSA MELICERTE* (Drury).—*a.* Leaba; December, 1899.
 133. *REMIGIA ARCHEŞIA* (Cram.).—*a.* Mount Patti, Lokoja; May, 1899.
 134. *PLECOPTERA RESISTENS* (Walk.).—*a.* Ilo; March, 1899.
 135. *ENTOMOGRAMMA PARDUS* (Guen.).—*a.* Jebba; May.
 136. *HYPOCALA PLUMICORNIS* (Guen.).—*a.* Jebba; May.
 137. *CHARIDEA CAUTA*.—*Charidea cauta*, Hampson (in MSS.).
a. Mount Patti, Lokoja; May, 1899.

Family GEOMETRIDÆ.

138. ? *ACROPTERIS ANGULATARIA* (Fabr.).—*a, b.* Jebba; May and October, 1899.
 139. *PARUMELEA PERLIMBATA* (Guen.).—*a.* Sierra Leone; February, 1898.

Family PYRALIDÆ.

140. *PHRYGANODES QUADRIGUTTATA* (Walk.).—*a.* Sierra Leone; February, 1898.
 141. *GLYPHODES SINUATA* (Fabr.).—*a.* Mozum, Benue River; June, 1899.

ON SOME NEW GENERA AND SPECIES OF HYMENOPTERA (ICHNEUMONIDÆ, CHRYSIDIDÆ, FOSSORES, AND APIDÆ).

By P. CAMERON.

ICHNEUMONIDÆ.

AMBLYJOPPA, gen. nov.

Antennæ stout, slightly compressed and dilated between the middle and the apex. Scutellum roundly convex, raised above the level of the mesonotum; its sides not margined, the apex with a flat, oblique slope. The base of the median segment has a distinct oblique slope; the areola is somewhat horseshoe-shaped, slightly narrowed behind; it is flat, raised, smooth and shining; the sides, except at the apex, are furrowed, the furrows becoming wider and striated towards the apex; the posterior, median, and the spiracular areæ only are clearly defined; there are no spines or projections, and the apex of the segment has a gradually rounded slope. Areolet narrowed at the top. Abdomen closely punctured; the segments are closely punctured and do not project much at the apex laterally. Legs stout; the apex of the hinder femora does not extend beyond the third segment. The post-petiole is wide and clearly separated; on the second segment only the part between the gastrocœli is striated. The abdomen is comparatively short, being not much longer than the head and thorax united; its apex is bluntly pointed and broad; it is not quite half the length of the penultimate; the ovipositor is broad and projects.

The temples are obliquely and rather sharply narrowed; the occiput is roundly incised, and is sharply margined; the malar space is large; the apex of the clypeus is transverse; the labrum slightly projects; the second joint of the maxillary palpi is widely dilated; the mesopleural tubercles are long, narrow, and plate-like; the ventral keel extends on to the fourth segment, and is not very distinct. There is a short stump of a nervure on the cubital-disco nervure. The wings are dark-coloured.

The species I have included in this genus are large handsome insects. The characteristics of the genus are the roundly convex scutellum and the flat, raised, smooth and shining areola. The median segment is completely areolated; there are three basal and five apical areæ, besides the spiracular area. The basal joints of the flagellum are elongated, more than three times longer than wide; the transverse median nervure is not quite interstitial; the transverse cubital nervures may be distinctly separated above, or they may be almost united.

To this genus belongs "*Ichneumon*" *ælanus*, Cam.,* which appears to be a common Indian species.

AMBLYJOPPA RUFO-BALTEATA, sp. nov.

Nigra, capite thoraceque flavo-maculatis; abdominis medio lato

* 'Manchester Memoirs,' xl. pt. 4, p. 8.

rufus, apice petioli flavo; pedibus nigris; tibiis tarsisque late flavis, tarsis nigro-maculato; alis fusco-violaceis, nervis stigmatique nigris. ♀.

Hab. Khasia Hills (coll. Rothney).

Antennæ stout, slightly dilated and compressed before the middle; the tenth to fifteenth joints white below; the scape minutely punctured, thickly covered with white pubescence. Head black; the face, clypeus, labrum, except in the middle, the inner orbits, the outer on the lower half—narrowly above, broadly below, the yellow extending to the base of the mandibles—pale yellow. Face and clypeus punctured, thickly covered with short white hair; the front above closely punctured. Thorax black; the edge of the pronotum, two short lines shortly behind the middle of the mesonotum, the scutellum, post-scutellum, two somewhat triangular marks on the sides of the metanotum, extending on to the spiracular area, the tubercles, a large mark on the under side of the mesopleuræ—rounded in front, obliquely narrowed at the apex—pale yellow. Mesonotum opaque, distinctly punctured in the middle, less distinctly and more closely on the sides; and thickly covered with short fuscous pubescence. Scutellum roundly convex, punctured, and thickly covered with long pale hair; post-scutellum smooth, thickly covered with fuscous hair. Median segment rugosely punctured; the supramedian area has the basal half narrowed; the base in the middle transverse and slightly more than half the width of the apex; inside it is not depressed, is smooth and shining; the apex with two rows of punctures, the basal row not reaching to the sides; the posterior median and posterior intermedian areas are stoutly transversely striated, the latter more strongly than the former. Pro- and mesopleuræ closely punctured, their apices more or less striated; metapleuræ closely rugosely punctured, above the middle keel more or less obliquely striated. The lower part of the stigma and the apical nervures are fuscous; the areolet five-angled, at the top half the width of the bottom; the recurrent nervure is received shortly behind the middle. Legs black; all the trochanters, the four anterior coxæ, the apices of the four anterior femora, the anterior tibiæ in front and at the base behind, the basal part of the intermediate to shortly beyond the middle and the basal two-thirds of the hinder pair, and an irregular mark on the top and sides of the hinder femora—broad above, narrow on the sides—pale yellow; tarsi pale yellow, the basal three joints at the apex and the apical two entirely black. Abdomen black; the apex of the petiole yellow; the second and third segments entirely, and the base and sides of the third, ferruginous. The petiole is depressed in the centre above, the base irregularly roughened; the apex rugosely punctured; the base of the post-petiole rugosely punctured; the apex less strongly punctured; the sides are closely, strongly, obliquely striated; the second, third, and fourth segments are closely punctured; the second closely, longitudinally striated at the base; the gastrocœli on their inner sides with curved striæ.

ACANTHOJOPPA, gen. nov.

Antennæ dilated and compressed beyond the middle. Scutellum pyramidal, the base with an oblique slope; the top roundly depressed; the sides of the top leaf-like; the apex has a more abrupt slope, is

shorter, and has its sides keeled. Median segment completely areolated; the base in the middle is depressed; there are five basal areolae and three apical ones; the areola is completely defined; its base transverse; its sides oblique; the sides at the apex are oblique; the apex rounded inwardly. The spines are long and stout; the basal depression is keeled laterally. Face flat, hardly projecting in the centre; the labrum projecting. Occiput widely incised. Temples broad, obliquely narrowed. Areolet five-angled, narrowed at the top; the cubito-disco nervure has an almost obsolete stump of a nervure. Wings hyaline, or slightly infuscated at the apex. Legs long; the apex of the hinder femora reaches to the fourth segment. Petiole long and slender; the post-petiole becomes gradually wider from the base to the apex; the second and third segments are closely aciculated; the others smooth; the apical three segments become gradually narrowed; the last is largely developed; the cerci are prominent; the ovipositor largely projects; the ventral keel is large, and extends to the apex of the fifth segment.

The species of this genus known to me are uniformly ferruginous, with the wings hyaline, or yellowish-hyaline, at the most only slightly smoky at the apex; the antennae are similarly coloured, darker towards the apex and lighter in the middle. The median segment is more regularly and completely areolated than usual; the sides of the abdominal segments do not project laterally. In the male the antennae are not distinctly serrate.

A distinct genus, easily known by the flat face, the completely areolated median segment, with its stout spines; the pyramidal scutellum, deeply depressed on the top; and the abdomen narrowed at the apex, and with a long projecting ovipositor. In the arrangement of Kriechbaumer and Ashmead, the genus would come in near *Cryptojoppa*.

ACANTHOJOPPA SCHIZOASPIS, sp. nov.

Ferruginea, facie, clypeo, pleurisque flavis; antennis ferrugineis, apice late nigris; alis fulvo-fumatis, stigmatibus ferrugineo. ♀.

Long. 15-16 mm.

Hab. Khasia (coll. Rothney).

Antennae rufo-fulvous, beyond the sixteenth joint black; the scape punctured, thickly covered with short black hair; the flagellum with a pale down. Head rufo-fulvous; the face and clypeus with a paler yellowish tinge; closely and rather strongly punctured; the apex of the clypeus impunctate in the middle; the labrum closely punctured; thickly covered with long fulvous hair. The apex of the mandibles broadly black. Front very smooth and shining; the vertex shagreened; the orbits yellow. The mesonotum dark rufous; closely punctured, thickly covered with short black hair. Scutellum large, pyramidal; the base with an oblique slope; the apex almost perpendicular; the top roundly and deeply depressed; the sides somewhat triangular, rounded; margined; the basal keels large, curved, acute; the basal depression narrow, transverse, not very deep; the hair thick, long, blackish. Post-scutellum yellowish, with an obliquely rounded slope;

the centre closely and finely striated; the sides with a few stout striations; the depressions at its sides wide, shallow, and marked with stout keels; the base of the median segment in the centre has a rounded slope, deeply depressed in the middle, and bordered with a stout keel round the sides and apex; the apex is rugose. The supramedian area is slightly wider than long; the base almost transverse; the sides at the base oblique; at the apex more sharply oblique; the apex bulges roundly inwardly; the posterior median area is of almost equal width throughout; the teeth are large, broad; the base of the segment is strongly punctured; the supramedian area has a few oblique striations; the apex strongly transversely striated. The upper part of the propleuræ is strongly punctured; the centre at the base with a few fine oblique striations; the lower part at the middle and apex with stout, irregular, mostly curved, keels. Mesopleuræ strongly punctured; the middle with some stout longitudinal striations; the tubercles large, elongate, leaf-like, roundly narrowed at the base and apex. The base of the metapleuræ above finely, the rest coarsely, punctured, the punctures running into reticulations; in front of the hinder coxæ are some stout oblique striations, and in front of these is a stout curved keel. Mesosternum thickly covered with fuscous hair, punctured; the furrows deep, much widened at the apex. Legs stout; the four anterior coxæ and trochanters more or less yellowish; the hinder strongly punctured; the hinder tarsi spinose. The costa and stigma are luteous; the nervures darker; the areolet narrowed at the top, the transverse cubital nervures almost uniting there; the first is largely bullated at the top; the second in the centre; the recurrent nervure is received in the centre of the areolet; the transverse median nervure is received distinctly in front of the transverse median. Petiole yellowish at the base, the apex shagreened; the sides at the apex with some large deep punctures. The other segments are closely punctured; blackish down the middle; the gastrocelli shallow, closely punctured; the space between them striated. The sheaths of the ovipositor fulvous, densely haired; the apex black.

(To be continued.)

SOUTH AFRICAN COCCIDÆ.—II.

By T. D. A. COCKERELL.

Aspidiotus (Marganella) maskelli, Ckll.

Botanical Gardens, Durban, Natal; on twigs of *Camellia* (Fuller). New to the African continent; it has been found in Mauritius by De Charmoy.

Hemichionaspis cyanogena, Ckll.

Verulam, Natal (Fuller). Botanical Gardens, Durban, Natal; on *Alternaria* (Fuller). The last-mentioned material showed circumgenital glands as follows: median, 17; cephalolateral, 16; caudolateral, 13. The type had median, 11; cephalolateral, 17; caudolateral, 15.

Chionaspis exalbida, n. sp.

♀. Scales crowded, about $1\frac{1}{2}$ mm. long, convex, very narrow, pure white, with yellow-brown exuviae; the second skin has the basal half covered with white secretion, but the apical half is bare and clear brownish yellow.

♀. Deep carmine-red (turns green on boiling in caustic potash), elongate, the margins of the segments nowhere projecting. Caudal end scarcely chitinated; no circumgenital glands; the usual rows of transverse dorsal glands, but they are irregular, with few glands; margin of caudal end with many lobules, which hardly take the form of definite lobes; the median lobules are rounded, and separated by a rather wide interval, and present a projecting point at their outer edge; after these come two rounded prominences, then two rounded depressions, separated by a prominence which is sometimes bifid; then comes a little projection, and then a large gently convex portion, then a notch, and after that a few notches at rather distant intervals. There are apparently no squames, but specimens which have not been treated with potash show a short waxy fringe taking the place of squames.

♂. Scales of the usual *Chionaspis* form, but texture quite dense; unicate, some faintly tricarinate.

On leaves of aloe, Howick, Natal (*Fuller*). This is not a true *Chionaspis*, but there is no other genus to receive it.

Poliaspis carissæ, n. sp.

♀. Scale similar to that of *P. cycadis*, but perhaps narrower; second skin pale, as in *cycadis*.

♀. Similar to *P. cycadis*, but the strongly serrulate reddish-brown median lobes are wide apart, the interval being nearly as great as the breadth of a lobe; the second lobe consists of two lobules, of which the inner is the larger, and its tip projects a little beyond the level of the tips of the median lobes; the margin just beyond the second lobe bears two large oval dorsal glands, like those of the series on the next segments anteriorly; there are only four dorsal glands in the short rows nearest the anal orifice. The middle of the body is red-brown, and strongly chitinated. Circumgenital glands in eight groups; the posterior laterals 19, middle laterals (cephalolaterals of other genera), 11, median 5, in a transverse row, and the anterior groups characteristic of *Poliaspis* form a transverse series broken into three linear groups of three or four, which are widely separated.

♂. Scale tricarinate.

On *Carissa* (? *C. grandiflora*, DC.), a plant which belongs to the Apocynaceæ. Durban, Natal (*Fuller*). In this species and *P. cycadis* the anterior groups of glands are in transverse lines; in *P. media*, and the species described by Fuller from Australia, the groups are circular.

Halimococcus lampas, Ckll.

Mr. Fuller sends new material on the palm, *Hyphæne crinita*, Gaertn. This palm is a native of Natal.

Dactylopius filamentosus, Ckll.

Mr. Fuller sends a large variety of this species on orange, and says it is more common upon a native *Dombeya*. The antennæ measure as follows in μ , joints: (1.) 30, (2.) 42, (3.) 30-36, (4.) 39-45, (5.) 24-30, (6.) 33, (7.) 75-78.

Ceroplastes candela, Ckll. & King, n. sp.

♀. Long. $2\frac{3}{4}$, lat. $3\frac{1}{2}$, alt. $4\frac{1}{2}$ mm.; dark red-brown, elevated, with vertical sides. Caudal horn a prominent stout spine, hardly $\frac{1}{2}$ mm. long, placed nearer the top of the scale than the base. Dorsum smooth and shining, with only a very small central raised line. Sides of insects with vertical stripes of dense white secretion; no wax, except that composing these stripes, between the insects, which are densely crowded together, their vertical sides contiguous. They rest on a thin substratum of wax, and are covered above with yellowish-white wax, about 1 mm. thick. The outlines of the insects are vaguely marked on the surface of the covering wax by a brownish stain. The wax, with the insects beneath, surrounds the twigs as the wax does the wick of a candle; the whole mass is about 20 mm. diameter, that of the twig being about 5 mm.

Mr. King found the antennæ to measure thus in μ :—

Joints:	(1.)	(2.)	(3.)	(4.)	(5.)	(6.)	(7.)
Length:	56.	68.	56.	60.	28.	32.	40.
Breadth:	64.	48.	40.	32.	28.	28.	24.

Found by Mr. Fuller at Richmond, Natal. The nearest ally is an undescribed species from Paraguay, collected by Professor Bruner.

Ceroplastes egbarum, Ckll., subsp. *fulleri*, T. D. A. & W. P. Ckll., n. subsp.

♀. Waxy scale hemispherical, long. $15\frac{1}{2}$, lat. 12, alt. 10 mm.; in dry specimens rough, pale reddish, not divided into plates. ♀. Devoid of wax hemispherical, very dark red-brown, long. $8\frac{1}{2}$, lat. 8, alt. 8 mm.; sides infolded beneath, so that the inferior aperture is considerably smaller than the diameter of the scale. Anterior end narrowed and elevated, having the form of the end of a pig's snout. Caudal horn distinct, but very short, about $\frac{1}{2}$ mm. long; a very deep ulcer runs from below the caudal horn to the margin. Middle of back with a prominence about as high as the caudal horn, but larger, because lengthened posteriorly, having a keel-like form.

In caustic potash the female gives a deep madder-red colour; this colour is obliterated, leaving only a faint greenish tint, by the addition of acetic or nitric acid. On adding more potash, so as to neutralise the acid, the red colour is restored. The wax is not altered in colour by chloroform.

Skin with several large (about 800 μ diam.) strongly chitinous red-brown patches, thickly perforated with small gland-pores, recalling the puzzle of a garden sprinkler. Legs ordinary, except that the femur is very stout; measurements in μ : femur with trochanter, 192 (width of femur 95); tibia, 160; tarsus, 81; claw, 27. Tarsal digitules about 100 μ long, very fine hairs, with rather large round knobs. Claw-digitules stout, about 36 μ long, with large dark brown knobs.

Sent by Mr. Fuller, labelled: "Large red *Ceroplastes*, on *Acacia* and *Mimosa*, coast of Natal." This is probably a valid species; Mr. Fuller seems to consider it different from the ordinary white species, *C. egbarum* (*cristatus*, Green). Some time ago Dr. Strachan sent me from Lagos a very large *C. egbarum*—waxy scale, long. 20, lat. 13, alt. 10 mm.—with the dorsal area of the wax slightly pinkish. This seems to be another distinct variety or subspecies, but the material was not sufficient for satisfactory description.

Mr. Fuller writes that it is from the species of *Ceroplastes* that the Kaffirs make their head-rings. The large white species on *Mimosa*—I suppose *C. egbarum*—is the one most commonly used, as it is very plentiful. Mr. Fuller thus describes the process:—"The head-rings are made from a mixture—half and half, I am told—of calcined coccids and fresh material. Of course, no effort is made to extract the insects, a fact which accounts no doubt for the intense blackness of the rings."

East Las Vegas, New Mexico, U.S.A.

Jan. 14th, 1902.

NOTES AND OBSERVATIONS.

THE NOMENCLATURE OF THE COCCIDÆ.—In the course of revising the genera of Coccidæ, I have found the following new names and changes of name apparently necessary:—

(1.) *Ultracelostoma*, new subgenus of *Celostomidia*; female adult without mouth or legs; antennæ more or less rudimentary. Type *Celostomidia assimilis* (*Celostoma assimile*, Maskell), from New Zealand.

(2.) *Arctorthesia*, new section of *Orthesia*; female with waxy secretion dense, not easily removed; wedge-shaped lamellæ in dorsal line. Boreal forms. (*O. occidentalis* and *O. cataphracta*.)

(3.) *Bambusaspis* new section of *Asterolecanium*; scale elongated, often very narrow; living on bamboos and palms in the Tropics. Includes *A. miliaris*, *A. bambusæ*, *A. delicatum*, *A. solenophoroides*, *A. palmæ*, *A. urichi*.

(4.) *Phenacobryum*, new section of *Asterolecanium*; scale with laminae resembling moss-leaves. *A. bryoides* (Maskell) and *A. stellatum* (Maskell, as *bryoides* var.).

(5.) *Ascelis*, Schrader; n. syn. *Cystococcus*, Fuller, Tr. Ent. Soc. Lond. 1899, p. 462. (*A. echiniformis* (*Cystococcus echiniformis*, Fuller)). T. D. A. COCKERELL; E. Las Vegas, New Mexico, U.S.A.; Feb. 2nd, 1902.

NOTE ON LARVÆ OF CHRYSOPHANUS PHLÆAS.—I obtained a large number of *C. phlæas* ova last October, from captured females. The larvæ duly hatched out, and have lived through the winter in a conservatory, but not heated, except by means of a lamp, just enough to keep the frost from plants. Some of them appear to have fed all through the winter and are now full grown, while others are small.

those found in the open to-day by my son were all very small.—
E. SABINE; The Villas, Erith, March 13th, 1902.

CATALOGUE OF THE LEPIDOPTERA OF IRELAND. — There are three points I am sorry not to see touched upon in the review of this Catalogue (*ante*, p. 54). First, why *Cenonympha typhon* occurs further south in Ireland than in England, *i.e.* why it should occur in the Killarney district and not in the wilds of Dartmoor and Exmoor, in Devonshire. Second, the occurrence of *Bankia argentula* both in the English fen counties and in the west of Ireland, but not in the intervening space. Third, why should our islands have been restocked from the Continent since the climax of the Glacial Period? One question is, how long might the ova and pupæ of insects remain buried in the earth or in rubbish, beneath snow and ice? If they can do so for years, what occasion was there for our islands to be restocked? Another is, was not the greater part of Europe overwhelmed, as much as our own islands? What prevents our islands from being part of the Arctic Regions but the changeability of the winds? Should the wind blow uninterruptedly from the north-east for twelve months or more, we shall again have a glacial period.—C. W. DALE; Feb. 8th, 1902.

CAPTURES AND FIELD REPORTS.

COLIAS HYALE NEAR DARTFORD IN 1902.—While out collecting larvæ this morning, one of my sons saw a male of this species disporting itself on the railway bank. It passed close by him several times, apparently in good condition, its colour being very bright. I should fancy this is a "record" early appearance. Are we to have a third *hyale* year in succession?—E. SABINE; Erith, March 13th, 1902.

THECLA W-ALBUM AND COLIAS EDUSA IN BRISTOL DISTRICT.—It might interest some readers to know that *T. w-album* was very common last year in certain favoured spots at Bristol, while in the season of 1900 it was positively swarmed. In the latter year *C. edusa* was very abundant in Leigh woods and neighbourhood.—M. J. L. DAVIS; Lyndhurst, 10, Ronnan's Avenue, Redland, Bristol.

YORKSHIRE DRAGONFLIES.—Mr. H. J. Burkill sends the following notes on Yorkshire dragonflies:— "In the 'Entomologist' for February last *Cordulegaster annulatus* is reported for 1901, from Yorkshire. I saw two insects of this species on Aug. 15th, 1901, in Hayburn Wyke, a wooded ravine on the coast, six miles north of Scarborough. Being unprovided with a net, I could do no more than stalk them slowly, and on one occasion stood for nearly ten minutes within five yards of one of the pair which was sunning itself on an ash-trunk. I think there is no doubt as to the identity of the species, the alternate yellow and dark bands being so very conspicuous. A few miles further north, on Sept. 4th, 1899, I captured several specimens of *Sympetrum scoticum* on the moors. This last year, in June, I found *Libellula depressa* very abundant on the cliffs south of Scarborough, together with *Ischnura elegans* and a few *Agrion puella*. I might add that I picked up a dead male *Calopteryx virgo*, in the road

near Hackness, in August, 1897 or 1898. The insect had been run over in the dust, but was almost perfect nevertheless."—W. J. LUCAS.

ESSEX DRAGONFLIES. — As no records for dragonflies at Romford exist, it cannot be out of place to mention that Rev. W. Claxton took the two common species, *Libellula depressa*, male (May 22nd), and *Agrion puella*, female (June 8th), in his garden at Navestock Vicarage, in 1901.—W. J. LUCAS.

LEPIDOPTERA HETEROCERA OF PARIS. — The following is a list of Lepidoptera Heterocera obtained in the suburbs and environs of Paris in June and July, 1901:—*Smerinthus tiliæ*, Rue des Dames Augustins; one specimen freshly emerged. *Sphinx ligustri*, two specimens obtained from the lads of the racing stables, Maison Lafitte. *Macroglossa stellatarum*, Courbevoie, Forest of St. Germain, Parc Maison Lafitte; here, as elsewhere, on viper's bugloss. *Saturnia pavonia major*, one specimen (given me at Hôtel de la Gare, Fontainebleau). *Lasiocampa rubi*, ditto. *Odontestis potatoria*, two specimens obtained from the lads of the racing stables, Maison Lafitte. *Euchelia jacobææ*, one specimen taken, Parc Maison Lafitte. *Liparis salicis*, *L. auriflua*, and *L. chrysorrhæa*, one specimen, Boulevard Bineau, Neuilly. *Arctia villica*, one specimen, Chantilly. *Plusia gamma*, a few seen, lucerne field, Courbevoie. *Venilia maculata*, two captured, Forest of Fontainebleau. *Campptogramma bilineata*, common, Parc Maison Lafitte and Forest of St. Germain. In September, 1901:—*Macroglossa stellatarum*, seen, Courbevoie. *Saturnia pavonia major*, seven specimens obtained from the tram conductor, Port Marly. *Smerinthus populi*, *Sphinx ligustri*, and *Acherontia atropos*, all in possession of tram conductor, but in indifferent condition, Port Marly. — (Rev.) F. A. WALKER; Dun Mallard, Cricklewood.

NOTES FROM THE CHESTER DISTRICT.—On July 19th I took a larva of *Notodonta dictæa*, and one of *Acronycta alni*, off some red willow near Shotwick. The first-mentioned emerged as a perfect insect on August 18th—a representative of a second brood. The larva of *A. alni* spun up on August 5th. On August 26th a friend sent me a full-grown larva of *Cossus ligniperda* in an ordinary chip match-box. Fortunately it arrived safely, but it had so enveloped itself in a cocoon that I left it as it was. About a month afterwards it bit its way out into the cage, and then surrounded itself with another web. This, I expect, from previous experience, to be its last performance before appearing as a moth in June. Larvæ of *Smerinthus ocellatus* were common, here and there, on willows and salallows. From a single bush near Saughall a friend and I gathered over a dozen on August 21st; but it was the only favoured shrub among six or eight. From sedges by a pond side I got four pupæ of *Plusia festuæ* in their long cocoons of white silk on August 31st. The moths emerged between Sept. 2nd and Sept. 13th, and I am inclined to look upon them as a third brood (see Entom. xxxiv. 257). In a particular spot of Delamere Forest, where branches of the Scotch firs are well within reach, I went to beat for larvæ of *Macaria liturata* on Sept. 13th. The sooty melanic form occurs with the type, and has been given the varietal name *nigrofusca* by Mr. J. Collins, of Warrington (Entom. xxxiv. 364). Thunberg's name for the species was *M. fuscata*, and this sets out

wondering if his type was our varietal form. I got three species of larvæ, and all very much like each other—*M. liturata*, *Bupalus piniaria*, and *Thera variata*. Skipping minor points of difference, all were green, all about the same shape and size, and all were striped with either white or yellowish white; but the red-brown head, legs, and claspers easily marked out *M. liturata*, while the white dorsal line of *B. piniaria* separated the latter from *T. variata*. Some imagines of *T. variata* appeared in October; possibly others are lying over till next June. But I was a week or more too late, and I did not get many of either species. The August brood of *Pararge megæra* showed up numerously in the neighbourhoods of Saughall and Shotwick. The under sides of this butterfly, with their delicate dark pencillings on a grey ground, their marginal crescents and target-like discs (I am referring to the secondaries), deserve more attention than perhaps they receive. Among "varieties" I have little more to add. I reared two or three dozen *Odonestis potatoria*, and I believe the following description holds generally good as far as the spots on the upper wings are concerned: "A white central spot, and a small white spot between it and the costa." One of my males is without this small white spot. On Oct. 12th I went to Delamere Forest with a friend who is great on fungi. These ephemeral things were the objects of his visit, mine were as many imagines of *Oporabia autumnata* as I could take. Fungi there were in profusion. Two species of the "fairy-rings" grew in the fields—the tasty champignon and the equally common "puff-balls." In the woodlands there were fungi scarlet, fungi violet, fungi white, and fungi chocolate. Broadly speaking, Nature marks the poisonous species in brilliant colours, like so many danger signals. On the birch trunks, no longer hidden by denser foliage, grew the fungus peculiar to these trees, *Polyporus betulinus*. This, when dried, forms a capital substitute for cork. It is pure white when dried and cut up, and the first entomological cabinet I ever saw was lined with strips of this fungus. By beating the birches I sent on the wing three geometers, which, from their silvery whiteness, may have been *autumnata*, but I failed to net them. And I was obliged to give the birches up, for they were so charged, in the early morning, with the rain-drops of the previous night, that beating the branches was like standing in a shower-bath. My friend left by a mid-day train, and I went to lunch at the 'Abbey Arms,' and then to dessert in the forest off luscious blackberries, which nobody seems to gather in these days of factory-made jams and "substitutes." But this led me among the oaks, and as everything was now dry, I eat them for all I was worth, as I had accidentally started two or three *Oporabias* from them. I got about two dozen altogether, including nice banded forms and paler specimens. But, thanks to the aid and assistance of Mr. L. B. Prout, they all turned out to be *O. dilutata*. The moral of this story, I should say, is keep away from oaks if you want *autumnata*, and stick to alder and birch (Entom. xxxiv. 43). At the electric lamps the luck continued, on the whole, deficient in quantity, although very fair in quality. On August 20th I took a moth new to the district, *Asphalia diluta*. Unfortunately it had been trodden upon as it rested on the pavement below the lamp. In September, *Anchocelis lunosa* was unusually plentiful, including pale

and dark forms. During the latter half of the month *A. pistacina* appeared. This moth exhibited varieties leading from the type to the unicolorous and nearly spotless bright-chestnut form. On the other hand, an intermediate pattern was so spotted as to strikingly remind one of *Dasyampa rubiginæa*. A few *Epinuda lutulenta*, all nearly black, were also taken during the month. My best capture, however, was on the 9th, a very fair specimen of *Heliothis armigera*. It is undoubtedly of British nationality, straw-coloured, instead of the dark form I always rear, say a month earlier, from larvæ found in foreign tomatoes. According to Mr. Walker's list, this is the second capture of the species in the district. *P. festuca* occurred again at the lamps, Sept. 9th, fresh from the chrysalis; and on the 21st one *Agrotis saucia*. A grand male *Dasypolia templi* turned up on Oct. 10th. Winter weather set in on Nov. 13th, with alternate rain, snow, and frost up to the 26th, when mild weather prevailed and brought out *Pæcilocampa populi*. Some individual examples of certain species occurred on such extraordinary dates that they suggest second broods; they were as follows:—*Hepialus humuli*, a small but fresh female, August 24th; *Spilosoma menthastri*, Sept. 2nd; *Porthesia similis=auriflua*, Sept. 8th. J. ARKLE; Chester.

NOTES FROM DORKING FOR THE SEASON OF 1901.—Of the four seasons that I have lived in this neighbourhood, the one just past has been far and away the best. I have worked hardest, like most of those who are, comparatively speaking, beginners in entomology, among the Diurni, intending to pay more attention to the Nocturni when the former are more complete. I will go through in order the forty-one species which I have taken here. Of course *Pieris brassicae*, *rapæ*, and *napi* were in profusion, the first-named perhaps less so than is the case sometimes. *Euchloë cardamines* I took in plenty, especially males, from May 7th till May 23rd. *Colias edusa* was far from being so common as last year, only one specimen coming in my way, and that I did not take. *C. hyale* was seen on August 7th, and again on the 12th, when I got a male in good condition. *Gonepteryx rhamni*, for some reason or other, was far from common in the later summer, though the hibernated specimens were very plentiful from April 1st till the beginning of May. Among the Nymphalidæ I was very successful, for besides breeding a fine series of *Argynnis paphia*, I took *A. aglaia* and *A. adippe* in splendid condition from the beginning of July till about the middle of that month. *A. selene* and *A. euphrosyne* were also plentiful enough about the end of May. My *A. paphia* larvæ began to pupate on May 24th, and went on doing so till June 9th. The first imago appeared on June 10th, and the last on June 25th. Among the Vanessas, the larvæ of *V. urticae* were swarming during May and the first week in June, the first pupa appearing on June 4th, and the first imago on June 17th. *V. polychloros* occurred in greater numbers than I have previously experienced. The hibernated specimens were quite common during the first fortnight of April; the larvæ emerged from ova on May 13th and 14th, and pupated from June 10th to the 14th. The imagines came out from June 29th till July 2nd. I regard the profusion of this insect to be one of the events of the year. But the other members of the genus were con-

spicuous by their absence. I saw two hibernated specimens of *V. io* on April 19th, but not a single *V. atalanta* or *V. cardui*, though I heard of *V. atalanta* being seen. Of course *Epinephele ianira* and *E. tithonus* were in profusion, and *Satyrus* (*H.*) *semele* was to be obtained in some numbers about the end of July. *Aphantopus* (*H.*) *hyperanthus* was as common as *E. ianira* about the third week in July; and *Cænonympha pamphilus* was as usual too abundant to be pleasant. *Pararge* (*S.*) *megæra* was common in August, and *P. egerides* was to be taken in the middle of May, and again in the middle of August. Many of the *Lycænidae* were in the utmost profusion, notably *Thecla rubi*, from May 12th till June 6th; *Lycæna icarus*, of course more than once; *L. adonis* during the latter half of May and again towards the end of August; *L. corydon* from July 20th to August 3rd; *L. argiolus* from May 1st to the 23rd, and again at the end of July; and *Chrysophanus phleas* in the middle of May, in the middle of July, and again in the middle of August, one being seen as late as September the 29th. All the above *Lycænidae* were very abundant, but others occurred also. Though I have not yet succeeded in finding either *Thecla w-album* or *T. quercus* here, a friend sent me some pupæ of both these species, and I have got a fine series of each. *L. ægon* must abound somewhere here, but I have hitherto only found one or two specimens at a time, and it has been the same with *L. agestis*. *L. minima* (*alsus*) was quite plentiful towards the end of June and up to the middle of July, but was not in such numbers as *corydon*, *adonis*, *icarus*, or *argiolus*. An enthusiastic entomologist called on me one day (July 15th), and, in return for the meagre information I could give him as to this locality, he most generously gave me two fine specimens of *L. arion*, caught during the previous week in Cornwall. The second event of the season for me has been the successful rearing of *Nemeobius lucina* to the pupal stage. This insect is found near here in some numbers, and from May 15th to the 29th I took a fair quantity, being fortunate enough to secure a male and female *in coitu*. I placed the female in a cylinder with a primrose-root, and got a large batch of ova. The larvæ appeared on June 4th, and began to pupate on July 8th. I wondered whether the imagines would emerge this year, seeing that the pupæ were somewhat early; but none of those I kept have done so, nor can I hear of the emergence of any that I sent away to friends. Of the *Hesperidae*, I have taken five:—*Thanaos tages* and *Syrichthus malvæ* in May and the early part of June; *Hesperia sylvanus* in June and July; *H. thaumas* and *H. comma* in July. The very interesting article in this month's 'Entomologist' (xxxiv. 325-328) on the "Life-history of *H. comma*," has led me to hope that I may breed some next year.

So much for the *Diurni*, to which, as I said before, I have paid most attention, though I feel sure I have not yet exhausted the species to be found in our neighbourhood. *T. quercus* and probably *T. w-album* occur somewhere in the district, and *Melanargia galatea* must be about also; in fact, I have been told of its capture, though I could not ascertain the precise locality.

What I have done among the *Nocturni* has been chiefly breeding from ova or larvæ sent me by friends. I tried sugaring to a limited extent in August, but, like your correspondent, Mr. A. J. Lawrence, of

Bromley (*vide* Entom. xxxiv. p. 354), I met with no success at all. Woodlice and earwigs appeared in plenty, but not a single moth. Curiously enough, a young friend of mine who was sugaring on the same nights about half a mile away was fairly successful; the chief results he obtained being *A. pyramidea*, *T. fimbria*, and others of the same genus. I did very little net-work, but by means of light, or dusk, or by beating in the daytime, I took the following:—*S. ligustri*, *M. stellatarum*, *H. bombyliformis*, *Z. filipendula*, *E. jacobææ*, *P. bucephala*, *C. graminis*, *T. orbona*, *T. comes*, *T. pronuba*, *M. maura*, *P. moneta*, *E. mi*, *E. glyphica*, *C. nupta*, *U. sambucaria*, *R. luteolata*, *V. macularia*, *M. margaritaria*, *C. elinguaris*, *E. alniaria*, *G. vernaria*, *A. grossulariata*, and *E. cerrinata*.

As to breeding, I have mentioned in former notes (*vide* Entom. xxxiv. pp. 229 and 258) how that several Sphingidæ, *S. ligustri*, *S. ocellatus*, *S. populi*, and *S. tilie*, were much earlier this year than usual, and how I got a double brood of *S. ocellatus* and *S. populi*. I expected the same to occur with *S. tilie*, but it did not. I experienced a complete failure with some larvæ of *Hyloicus* (*S.*) *pinastri*, which died off after the fourth moult. A batch of about a dozen *C. elenor* fed up successfully on vine, and began pupating on August 11th, but several died in the attempt, and I am left with seven healthy pupæ. Larvæ of *E. jacobææ* were very plentiful on ragwort during the latter part of July; and on May 29th I found two fine larvæ of *A. caia*, which, however, refused to feed in confinement, and died before reaching the pupal stage. A batch of ova of *Z. æsculi*, which were given me, yielded larvæ on July 23rd, which are at present feeding inside a piece of apple-wood, as are also four larvæ of *C. ligniperda*. I was very successful with *Lymantria* (*O.*) *monacha*, which fed up on apple. The larvæ emerged on April 19th and 20th, pupated during the early part of June, and imagines began to appear on June 26th. Out of fifteen larvæ of *Malacosoma* (*B.*) *neustria*, also fed on apple, and which began to pupate on June 23rd, only four imagines resulted, the first appearing on July 11th. This autumn I have taken a number of larvæ of *Macrothylacia* (*B.*) *rubi*, which continued to feed on bramble up to the beginning of November, when they retired for the winter. A dozen larvæ of *Lasiocampa* (*B.*) *quercus* were sent me on April 30th. They were fed on poplar, and the first four spun up on May 16th or 17th. A male appeared on July 11th, two females on July 12th, and one female on July 19th. But the remaining eight went on feeding slowly till the first week in August, and are hibernating as pupæ. A brood of *E. versicolor* came out on April 21st, and were full fed by the first week in June; and a batch of *S. carpini*, which emerged on May 30th, fed up on willow till July 7th to 10th. Frequently on a hot day I have noticed the pupæ of this insect wriggling about inside the cocoon, the result being a harsh grating noise. I had a very late brood of *Pheosia* (*N.*) *dictæa* sent me from Bexley, the last of which did not cease feeding till Nov. 1st. During the previous week or ten days I had experienced considerable difficulty in getting fresh poplar leaves for them. I had a batch of ova of *C. fraxini* sent me from abroad, and from these (larvæ emerged April 27th till May 9th, pupated June 17th and next ten days) I got, from July 20th to August 4th, a fine series of imagines. They are very fine insects, and I experienced

no difficulty with them, for they fed quite readily on poplar. Why, then, do they not breed freely in England? Simultaneously with these I was breeding *C. nupta* and *C. sponsa*. The conditions were precisely similar in all three cases. *Sponsa* emerged from ova on April 23rd, 24th, and 25th, pupated May 28th to June 2nd, imagines appeared July 1st to 6th. *Nupta* larvæ came out April 27th till May 9th, spun up during the first week in June, and arrived at maturity July 7th to 17th. They are all very fine insects, and their breeding afforded me much pleasure. I brought through a summer brood of *S. illustraria*, which fed on birch from May 20th till June 11th. They grew very rapidly, and produced fine imagines from June 29th to July 4th. This struck me as being very quick work—*i.e.* forty days from ovum to imago, under natural conditions. I got some ova from a female, and hoped to rear a second brood, but unfortunately they all proved to be unfertile. A batch of *E. fuscantaria*, fed on ash from May 19th to June 21st, produced a good series, which emerged at intervals between July 22nd and August 17th. A very fine female of *A. betularia* var. *doubledayaria* was sent me from Yorkshire, together with a number of ova she had laid. Swarms of larvæ appeared on July 5th and 6th. They fed up successfully on lime, and pupated between August 20th and 26th, with the exception of one, which went on feeding till September 21st. Four *Kuonymus* bushes in my garden were, as last year, swarming with larvæ of *A. grossulariata*; but though I examined about a hundred of the resultant imagines, I failed to find any that were not typical.

The above represents the bulk of my work during the season of 1901, which I think I may fairly call a very satisfactory one.—F. A. OLDAKER; Parsonage House, Dorking, Dec. 7th, 1901.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—*March 5th, 1902.*—The Rev. Canon Fowler, M.A., F.L.S., President, in the chair.—Dr. B. Douglas Macdonald, M.D., of Malsette, Rhodesia, S. Africa; and Mr. Arthur M. Montgomery, of the Grove, Ealing, W., were elected Fellows of the Society.—Mr. L. B. Prout exhibited, on behalf of Mr. J. P. Mutch, of Hornsey Road, London, N.:—(a) *Vanessa (Eugonia) polychloros*, L., a female bred by Mr. H. Baker from pupa from Stowmarket, Suffolk, the ground colour much darkened and the black markings somewhat enlarged, &c.; suggesting perhaps the influence of cold at time of pupation (compare Tr. Ent. Soc. 1894, p. 431, &c.). (b) *Chrysophanus phleas*, L., an aberration (captured in the Isle of Wight, August, 1901) much suffused with the dark colour, especially at outer margin and on hind wings, only a very small patch of the red colour remaining at the inner angle of the latter. (c) *Agrotis puta*, Hb., a perfectly halved gynandromorphous example, the right side male, the left side female, taken in August, 1901, in the Isle of Wight. (d) *Noctua sobrina*, Gn., an aberrant specimen with white antennæ and a somewhat hoary appearance on the fore wings, taken in East Aberdeenshire, August, 1900.—Mr. A. Bacot exhibited a series of *Malacosoma castrensis* and a

series of *M. neustria* for comparison with a hybrid brood, resulting from a pairing between a male *neustria* and a female *castrensis*. Only a portion of the batch of from two hundred to three hundred ova that the female laid hatched. The last of the females that eventually emerged was three weeks ahead of the first male, and most unfortunately before any males of either of the parent species, so that the fertility of the hybrid females could not be tested. Their bodies apparently contain few, if any, ova. Mr. Bacot said he had every reason to believe, however, that he obtained pairings between the hybrid males and females of *castrensis*, in addition to fresh pairings between males of *neustria* and females of *castrensis*, and therefore had hopes of continuing the experiment next summer. Mr. J. W. Tutt said this was the first time any exhibition of experiments of the kind had been made before the Society by British investigators, though Mr. Merrifield had shown a number of crosses bred by Dr. Standfuss. In this case the colouring of the female hybrids, departing from the usual colour of the females of the parent species, appeared to approach more nearly in tint the females of the closely-allied Alpine species *M. alpicola*, and it would be interesting to discover whether the peculiarity of colour in the hybrid females really marked a tendency to revert to a more primitive type of coloration, such, for example, as that exhibited by *M. alpicola*. The sexes, as exhibited, were very clearly distinguishable, and there was not much tendency to gynandromorphism, though of sixty or seventy specimens almost every female showed some signs of male coloration. — Mr. O. E. Janson exhibited a pair of *Stephanocrates dohertyi*, Jord., a goliath beetle discovered by the late W. Doherty in the highlands of British East Africa. — Dr. T. A. Chapman exhibited cocoons of a Limacodid moth from La Plata, with empty pupa-cases of a dipterous parasite of the genus *Systropus*, obtained from Herr Heyne, who unfortunately had no imagines either of the moth or the fly. There is a close resemblance between the two pupa-cases, as seen by comparison with genuine Limacodid cases. The resemblance is, however, not merely of appearance, but functional also. The moth pupa, *i.e.* the moth itself inside the pupa-case, almost certainly by inflating itself with air, to secure greater size and a stiffened epiderm as a basis of muscular action, exerts an end-to-end pressure within the cocoon, and so forces off a lid. It is here that the beak or "cocoon-opener," with which the pupa is armed, is useful as determining that the fracture shall be at the right end, making the lid split off here, under much less pressure than would be efficient without it, and leaving no chance for fracture to occur at the wrong end when pressure is equally distributed. The *Systropus* breaks off a similar lid, no doubt by similar end-to-end pressure to that exerted by the moth, *Diptera* having highly developed the habit of inflating themselves with air, at emergence from the pupa. This pupa also has a beak very like that of the Limacodid, but even stronger and sharper. — Dr. Chapman also showed a Bombylid pupa-case from West Africa, very like that of some British forms, the head-armature of which is not a "cocoon-opener," but an excavating or navvying machine, for use in burrowing a way out of loose soil. such as that in which solitary bees' nests are found. The pupa of an African species of practically the same habits as this South American

one is described and figured in Prof. Westwood's Monograph of the genus *Systropus* in the 'Transactions' for 1876.—Mr. J. E. Collin, in further illustration of Dr. Chapman's remarks, exhibited specimens of:—(a) *Systropus* sp.?, from Buenos Ayres, parasitic on a Bombyliid Lepidopteron (*Limacodes*?). This he said was possibly the same as Dr. Chapman would have reared from his cocoons. The species was apparently undescribed, but most allied to *S. brasiliensis*, Meg. As Prof. Westwood noticed in 1876, the insect is very slender to inhabit so stout a pupa-case. (b) *Systropus* sp.?, a large handsome undescribed species from Bigot's collection.—Professor Poulton, F.R.S., introduced a paper by Mr. Guy A. K. Marshall, entitled, "Five years' (1897–1901) observations and experiments in the bionomics of South African insects, dealing especially with warning colours and mimicry, with appendices containing descriptions of new species by Col. C. T. Bingham and W. L. Distant." The paper was illustrated by many photographs projected on the screen showing the groups of South African insects of many orders collected by Mr. Marshall, each with a common type of warning coloration. Some of these groups included mimetic species of great interest. An important section of the paper contained the description of a long series of careful experiments conducted upon the chief vertebrate and invertebrate insect enemies of South Africa. The number of new facts is so large; the experiments so numerous and complete; and the range of observation extended over so many Orders, in addition to the much-studied Lepidoptera, that this memoir places South Africa in the first rank as the country from which the chief evidence in support of existing theories of mimicry, warning colours, &c., has been supplied. A discussion ensued, in which Mr. F. Merrifield, Dr. F. A. Dixey, Prof. Hudson Beare, Colonel Yerbury, Mr. J. W. Tutt, and Prof. Poulton took part.—Mr. Malcolm Burr, B.A., F.L.S., contributed "A monograph of the genus *Acrida*, with notes of some allied genera, and descriptions of new species," and Dr. D. Sharp, F.R.S., communicated three papers by Mr. R. C. L. Perkins, respectively entitled:—(a) "Notes on Hawaiian wasps, with descriptions of new species"; (b) "Four new species and a new genus of parasitic Hymenoptera (Ichneumonidæ) from the Hawaiian Islands"; and (c) "On the generic characters of Hawaiian Crabronidæ; four new genera characterized."—H. Goss and H. ROWLAND-BROWN, *Hon. Secs.*

SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—February 13th, 1902.—Mr. F. Noad Clark, President, in the chair.—Mr. South exhibited a specimen of *Cydimon (Urania) leilus* from St. Kitts, one of the Leeward group of the West Indies. The species is common along the north coast of South America and in Trinidad, but has not hitherto been taken in this island.—Mr. McArthur, some specimens of *Eupæcilia gilvicomana* taken about forty years ago by Standish, and stated that the species had not since been obtained in this country.—Mr. H. Moore exhibited an exceedingly fine specimen of the orthopteron *Sanaa imperialis* from Sylhet in North India.—Dr. Chapman, specimens of *Hypotia corticalis* from the Riviera, a species having some of the characters of the genera *Pyralis* and *Phycita*, and for which he had proposed a new genus.—Rev. F. P. Perry, a

large number of Coleoptera from the Transvaal and Orange Colony taken by himself during a short residence in South Africa.

February 27th.—The President in the chair.—Mr. South exhibited a specimen of a very interesting form of *Macaria liturata*, which he had received from Mr. J. Arkle, who took it, with others, in Delamere Forest last year. This form is heavily suffused with fuliginous brown; it has been figured in vol. vi. of Barrett's 'Lepidoptera of the British Islands,' and Mr. Collins has recently proposed the name *nigrofulvata* for it (Entom. xxxiv. 364).—Mr. McArthur, an example of *Agrotis segetum*, having a narrow, very dark marginal band on each of the hind wings, the white ground colour and fringes making it a very conspicuous character.—Mr. Edwards, an unusually large and perfect nest of *Vespa vulgaris*, obtained near Rochester in a hollow tree.—Dr. Chapman, specimens of *Crinopteryx ganciliella* bred from larvæ. It belonged to the lower section of the Adelidæ, and lived in cases like the Coleophoræ, to which it had no structural relation whatever.—Mr. R. Adkin, long bred series of *Acidalia marginepunctata*, and read a paper on them entitled, "A Life-cycle of *Acidalia marginepunctata*." A discussion ensued, when it was pointed out that the genus certainly required subdivision, both on account of diversity of structure and of distinction of habit.—HY. J. TURNER, *Hon. Rep. Sec.*

BIRMINGHAM ENTOMOLOGICAL SOCIETY. — *January 20th.*—Mr. H. Willoughby Ellis, Vice-President, in the chair.—The following were exhibited:—By Mr. R. C. Bradley, a series of *Hyetodesia vagans*, a species which is not included in Mr. G. H. Verrall's recent list of British Diptera, but which is common and well-known in Sutton Park; also a specimen of *Sphex planipennis* taken by Mr. J. T. Fountain in Jersey last year. It is a large and handsome Fossore, which is uncommon in Britain. By Mr. C. J. Wainwright, *Rhyssa persuasoria*, one of our largest, handsomest, and rarest Ichneumonids, taken by Mr. J. T. Fountain in Derbyshire last year; also a fine series of *Tropidia scita (milesiformis)*, taken near Paignton, South Devon, in a damp meadow by the sea; it is a species which is common in the fens, but was not known before from the West of England; it was, however, in abundance at this one spot. By Mr. H. Willoughby Ellis, the following Coleoptera:—*Nebria gyllenhali*, from Matlock; *Pterostichus oblongo-punctatus*, from Buxton, and *Iliosoma oratulum* var. *collaris*, from Knowle. The last-named was a form which he said some Coleopterists believed to be only an immaturity, but he had taken it at all times of the year, and many specimens were undoubtedly mature. By Mr. Aug. D. Imms, extreme forms of *Satyrus semele*, from Wales; one, very dark and strongly marked, came from near Barmouth, and was taken on the slate; and the other, a light, bleached-looking, but apparently perfect specimen, from near Llandudno, where it was taken on limestone. Mr. Imms read a paper upon "The Structure and Distribution of the Collembola," in which he gave a thorough account of the external and internal anatomy, with some account of the embryology, and illustrated it with black-board drawings and microscope preparations.

February 17th.—*Annual Meeting.*—Mr. G. T. Bethune-Baker, President, in the chair.—The Thirteenth Annual Report of the Council was read, and the Treasurer's Annual Report presented,

showing a slight balance in the Society's favour.—The following officers were elected for 1902:—Mr. G. H. Kenrick, F.E.S., President; Mr. G. T. Bethune-Baker, F.L.S., F.E.S., Vice-President; Mr. R. C. Bradley, Treasurer; Mr. A. H. Martineau, F.E.S., Librarian; and Mr. C. J. Wainwright, F.E.S., Secretary. The following were also elected on to the Council:—Messrs. H. Willoughby Ellis, F.E.S.; J. T. Fountain; W. Harrison, and G. W. Wynn.—Mr. A. D. Imms exhibited, by means of a lantern, a series of microscopic preparations of the Collembola, including specimens of typical species and sections, &c.—Mr. J. T. Fountain showed a series of *Selenia bilunaria*, Esp. (*illunaria*, Hb.), of different broods; including a series bred June to August of var. *juliaria*, Haw., and others bred November to March, all of the usual spring form.—Mr. A. H. Martineau showed Hymenoptera taken at Budleigh Salterton, South Devon, at beginning of August last year, including *Andrena pilipes*, F., and *A. thoracica*, F., both from bramble bloom; *Astatus boops*, Schr., taken at blossoms of gorse; *Andrena denticulata*, Kirb.; *Nomada fucata*, Panz.; *Dasygaster hirtipes*, Latr.; *Hedyceridium roseum*, Rossi, the parasite of *Astatus boops*, Schr.; and *Trypoxylon figulus*, L., with cells which had been found in sand, instead of in the more usual wooden posts.—COLBRAN J. WAINWRIGHT, *Hon. Sec.*

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.—The Annual Meeting was held at the Royal Institution, Liverpool, on January 13th, Mr. R. Wilding, Vice-President, in the chair.—Mr. Frederick Birch, Joint Secretary, in presenting the Council's report, gave a short *résumé* of the work of the past session. The Treasurer then read his statement, which showed an increased and satisfactory credit balance to be carried forward. The following officers were elected to serve during 1902:—President, Mr. S. L. Capper, F.L.S., F.E.S.; Vice-Presidents, Rev. R. Freeman, M.A., and Dr. H. Dobie; Secretaries, Messrs. Fredk. Birch and E. J. B. Sopp, F.R.Met.Soc., F.E.S.; Treasurer, Dr. J. Cotton, F.E.S.; Librarian, Mr. F. C. Thompson; Council, Messrs. R. Wilding, F. N. Pierce, F.E.S., A. Tippins, H. Tonkin, W. A. Tyerman. In the absence of the President, the retiring Vice-President, Mr. R. Wilding, delivered a most interesting address, reviewing the general entomological work and literature of the first year of the century, with special reference to several matters of local importance. The Rev. R. Freeman proposed, and Mr. F. N. Pierce seconded, a vote of thanks to Mr. Wilding, both for his able address and for his valuable services in the chair during the past year, which was heartily accorded. On the motion of Mr. Sopp, a cordial vote of thanks was also tendered to Mr. Fredk. Birch, for his indefatigable labours as Secretary during the past three sessions. The following exhibits were made during the evening:—*Calioxys mandibularis*, a Hymenopteron new to the British list, taken at Wallasey, by Mr. Birch, who also exhibited, on behalf of the Rev. T. B. Eddrup, various species of Lepidoptera sent for distribution amongst students of the group; *Vanessa c-album*, captured in the Liverpool district, by Mr. G. A. Dunlop; and *Corydia petitveriana*, an attractively marked cockroach from Madras, by Mr. Sopp.

February 10th.—Mr. R. Wilding in the chair.—A valuable paper was read by Mr. Willoughby Gardner on the life-habits of the

Hymenoptera-Aculeata, dealing in a full and complete manner with all that is at present known of the life-history of these most useful hexapods. After describing the characteristic features of the order as a whole, he exhaustively reviewed the various families constituting the section Aculeata, the females of which are armed with a retractile sting. Dealing first with the Heterogyna, or social ants, he gave many facts of interest connected with the instinct and economy of these remarkable insects, and mentioned that most of our indigenous species belonged to the family Formicidæ, or mining ants. He also described the methods pursued by the Fossores in the capture and preservation of their prey. Of the Diploptera, or true wasps, two families are native to Britain; their value on account of their wholesale destruction of lepidopterous and other injurious larvæ being fully discussed. After enumerating the coleopterous and other inmates of the nests of *Vespa vulgaris* and *V. germanica*, the lecturer passed to a consideration of the Anthophila, or bees, alluding to the great part played in nature by these pollen-loving insects in the fertilization of clover and other plants. Having referred to *Colletes cunicularia*, our "Wallasey bee," and *Colioxys mandibularis*, a recent local addition to the British list, the concluding portion of the address was devoted to the life-history of *Apis mellifica*, the common honey bee, in which many interesting, historical, economic, and other matters were ably dealt with. At the close of his paper Mr. Gardner presented his recent monograph on the Hymenoptera-Aculeata of Lancashire and Cheshire to the library of the Society. A hearty vote of thanks was tendered Mr. Gardner for his interesting paper, and also for his welcome gift, after which the following exhibits were made:—*Bembidium saxatile*, from Garston, by Mr. F. Birch; *B. stomoides*, from the River Hodder, by Mr. C. E. Stott; *Tropiphorus tomentosus* (Heswall), *Berosus affinis* (Moreton), *Heptanclacus villosus* and *Egyalia rufa* (Wallasey), *Carcinops 14-striata*, &c., by Mr. R. Wilding; and a pair of the earwig *Pyrragra braziliensis*, from Espírito Santo, by Mr. E. J. B. Sopp. Mr. G. O. Day also exhibited some rare Dutch books by Sepp, the life-like coloured figures in which were greatly admired; and Mr. Oulton Harrison showed some excellent life-size photos of lepidopterous larvæ taken direct from nature.—E. J. BURGESS SOPP, *Hon. Sec.*

RECENT LITERATURE.

Handbook of the Natural History of Glasgow and the West of Scotland. (Pp. i-x; 1-567. Glasgow. 1901.

A series of handbooks have been prepared by the Local Committee in connection with the Meeting of the British Association for the Advancement of Science, held last year in Glasgow; the volume under notice being one of these. It is edited by G. F. Scott-Elliot, Malcolm Laurie, and J. Barclay Malcolm, and deals with the Fauna, Flora, and Geology of the Clyde area. The several lists seem to have been prepared with care, those treating of the Insecta extending to 103 pages. The number of species enumerated in each of the Orders, with which we are specially concerned, together with the names of the

compilers of the respective lists, and also the nomenclature adopted, are shown in the following table:—

Hymenoptera-Terebrantia (Konow). By And. Adie Dalglish	119	species.
Hymenoptera-Aculeata (Saunders). By J. Russell Malloch	104	„
Lepidoptera. "Macro" (Meyrick). By And. Adie Dalglish	515	„
Lepidoptera. "Micro" (Meyrick). By James J. F. X. King	390	„
Diptera (Verrall). By Percy H. Grimshaw & R. Henderson	506	„
Coleoptera (Sharpe & Fowler). By Anderson Fergusson	988	„
Trichoptera (M'Lachlan). By James J. F. X. King	... 108	„
Hemiptera Heteroptera (Saunders). By John E. Murphy	116	„
Hemiptera Homoptera (Edwards). By J. M. B. Taylor	119	„
Odonata (Lucas). By J. J. F. X. King	... 8	„
Orthoptera (Burr) By J. J. F. X. King	... 13	„
Neuroptera-Planipennia (M'Lachlan). By J. J. F. X. King	25	„
Collembola & Thysanura (Carpenter & Evans) By D. A. Boyd	38	„

The sequence of the Orders is somewhat unusual, and we are surprised that no mention is made of the Neuropterous families Psocidæ, Perlidæ, and Ephemeridæ.

Additional value to this important work is the inclusion therein of a large Bathy-Orographical map of the Clyde Basin, which was specially prepared for the Meeting of the British Association.

The Stridulating Organs of Waterbugs (Rhynchota), especially of Corixidæ.

By G. W. KIRKALDY, F.E.S. In the 'Journal of the Quekett Microscopical Club, April, 1901.

AFTER passing carefully in review the observations and opinions of writers who have referred to this subject, from Frisch, in 1740, to Handlirsch, in 1900, the author states his belief that stridulation is brought about in these insects by a method different from any previously suggested. "In 1874 Landois described the 'comb' on the anterior tarsus of the male in *Corixa*, and its action (as he thought) on the last segment of the rostrum." Kirkaldy, however, brings to notice the fact which he has discovered, that there is "on the inner surface of the femora (in the males only), near the base, a specially modified area of minute chitinous pegs arranged in regular rows." These form the *stridulating area*. In the author's opinion "the 'comb' of the *left* tarsus is drawn somewhat obliquely across the femur of the *right* leg, or *vice versa*," and in this way stridulation is brought about. This paper, which extends to fourteen pages, contains much valuable information on the structure and stridulation of waterbugs, the text being illustrated by two clear plates containing details from no fewer than twenty-six different species.

W. J. LUCAS.

Fauna Hawaiiensis.—Vol. i. pp. 277–364. Plates 8 and 9. Hymenoptera Parasitica. By W. H. ASHMEAD (August, 1901). Vol. iii. pp. 1–77. Plates 1–3. Diptera. By P. H. GRIMSHAW (Dec., 1901).

ONE HUNDRED AND TWENTY-EIGHT parasitic Hymenoptera are recorded by Mr. Ashmead, doubtless a small proportion of the forms actually existing in the Hawaiian Isles; of these, eighty-seven are new to science.

Of the fourteen families represented, all have a wide geographical range; the 128 species are distributed among sixty-nine genera, of

which eleven are peculiar, so far, to the islands, nearly all the others being cosmopolitan.

Our previous knowledge of this fauna was very meagre, four papers only being cited. The same remarks apply to the Diptera, only four short papers having been published previously. Mr. Grimshaw records 150 species—106 new to science—but regards the Diptera as still imperfectly known, as 134 species have as yet been noted from a single island. The great families Tipulidæ (s. s.), Tabanidæ, Bombyliidæ, and Empidæ, are entirely absent, while the Orthorrhapha Brachycera are very sparsely represented. The Anthomyiidæ and Drosophilidæ furnish the bulk of the forms, *Drosophila*, Fallén, being represented by nearly fifty species.

G. W. K.

Economic: A. D. HOPKINS, "Insect Enemies of the Spruce in the North-East" (1901, U. S. Dept. Agric. new series, Bull. 28, pp. 1-48; Plates i-xvi).

DR. HOPKINS is well known as the leading American authority on forest-tree insects, and has produced what must prove a valuable aid for practical measures in combating the damage occasioned to spruce by (principally) certain Coleoptera. An excessive death of spruce occurred in the Northern United States during the last century, to the extent of many billions of feet of timber, much of it a total loss. The principal depredator was a hitherto undescribed Scolytid beetle (*Dendroctonus piceaperda*, Hopkins), which attacks even apparently healthy trees, the largest trees and best stands of timber being most affected. The broods of the beetle do not remain in a tree more than a year after it commences to die, and out of one tree from five to seven thousand adults, on an average, may emerge. Their principal enemies are woodpeckers—which destroy from fifty to seventy-five per cent. on many trees in one year—aided by an ant-like predaceous beetle (*Thanasimus*) and a parasitic Hymenopteron (*Bracon simplex*). Remedies are also indicated and discussed. The beetles described are figured detailedly, and photographs of their mines and galleries, and of the trees in various stages of health and decay, are added.

Economic: E. P. FELT, "Scale Insects of Importance, and List of the Species in New York State" (1901, Bull. N. Y. State Mus., ix, pp. 289-377; 15 plates (7 coloured)).

AN account, with beautifully executed illustrations, of the principal Coccidæ of New York State, prepared in the detailed and careful manner usual with these Bulletins.

C. DARWIN.—The issue (by John Murray, 482 pp., crown 8vo) of a shilling edition of the 'Origin of Species,' is a noteworthy event in the history of natural science; the printing is clear and good, and the volume is a marvel of cheapness. The same firm has issued a 2s. 6d. edition of the 'Descent of Man,' in which so much entomological information occurs.

G. W. K.

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A LIST OF TORTRICES TAKEN IN SOUTH ESSEX BETWEEN 1885 AND 1901.

BY A. THURNALL.

HAVING recently left Stratford, after residing there more than twenty-six years, I have drawn up the following list, with a few notes, in the hope that it may prove useful to the small number of collectors who are interested in the Micro-Lepidoptera of Essex. During the sixteen or seventeen years which were devoted (as far as my very limited time would allow) to collecting, I have taken in South Essex—principally in the south-western portion of the county—about two hundred and ten species; if I had had more time to spare it is probable that a few more species might have been added to this list. I have included some half-dozen which have been taken in past years by the late Mr. Machin and others, and which in all probability only want looking for to be taken again. I will at some future time make out a list, with notes, of the Pyralididæ, Pterophoridæ, and Crambidæ (including the Phycitidæ), which have been met with by me during the same period and in the same district. In conclusion, if any beginner in the above groups should require assistance in naming captures, I should be most happy to help him, and also to impart what little knowledge I may have acquired as regards habits and food-plants of these most interesting little insects.

Tortrix podana (Scop.).—Generally abundant; the beautiful velvety var. *fusca* (St.) is not rare in both sexes; I bred a number some years ago from larvæ feeding on elder at Stratford. A var. of the female occasionally occurs in colour between the type and this variety.

T. cratægana, Hb.—Decidedly rare; in fact I did not meet with it until last season (July, 1900), when a single specimen, a worn female, was beaten from an oak on the borders of Monkwood, Loughton. Mr. Machin used to take it in the same district years ago.

T. xylosteana, L.—Very common, except, of course, on the salt marshes. The pale yellowish var. *obliquana*, St., not very uncommon. I once bred a large number of the type and a few of the var. from larvæ in rolled-up leaves of elm near Brentwood.

T. sorbiana, Hb.—Not very common, and rather local; I used to beat it from oaks near Brentwood, and have occasionally bred huge females from larvæ feeding on the same trees. Also taken at Wanstead, Loughton, Ongar Park Woods, &c.

T. rosana, Haw.—Generally common throughout, the larva feeding on very many plants. I bred a good many from larvæ feeding on dwarf willow (*Salix repens* var. *ascendens*) some years ago, and, curiously enough, everyone, without exception, came out female.

T. diversana, Hb.—Locally abundant, Wanstead, Brentwood, Warley, Romford, &c. Both beaten and bred from birch and elm. Some collectors, I believe, consider that the larvæ feeding on birch produce a different insect from those found upon elm, but after breeding a fairly large number I fail to see any distinction.

T. cinnamomeana, Tr.—Much more local than the last; a very few specimens beaten at long intervals from beech in Monkwood, and more commonly beaten from larch at Warley; also bred from the latter locality.

T. heparana, Schiff.—Very common throughout; may often be beaten abundantly from hedges towards evening. Seems little given to variation. I have never met with any wide departure from the type.

T. ribeana, Hb.—Perhaps the commonest species in the genus. The two named vars. *cerasana*, Hb., and *grossulariana*, St., also common, the latter especially so.

T. corylana, Fb.—Much less common than the last two species, and the latest of the genus to appear in the imago state. Generally to be obtained by beating oaks, especially the isolated trees. Loughton, Warley, Ongar, &c. This species does not appear to vary much; the only striking var. I ever met with was a small very dark specimen (Aug. 28th, 1891), almost as dark as *heparana*.

T. unifasciana, Dup.—Very common everywhere, often a complete nuisance when working the hedges in the evening. I once bred about thirty from one of those "bird's-nest"-like formations on a hornbeam, very much to my surprise, expecting, of course, to breed *Pyralis glaucinalis*, which has been bred from similar formations on birch twigs. The "nest" was taken early in April, and kept in a hat box till the imagos emerged; what they found to live upon has always been a mystery to me.

T. costana, Fb.—Very common, more especially in damp meadows; the var. *latiorana*, Wilk., not uncommon in the salt marshes, and strictly confined to them; more often found in the larva state. I have bred it (the variety) from larvæ feeding on *Aster tripolium* and *Statice limonium*. Thames Haven, Benfleet, and beyond Shoeburyness.

T. viburnana, Fb.—Local, and, as far as my experience goes, confined to the saltings, where the larva is commonly met with on such plants as *Aster tripolium*, folded leaves of *Statice limonium*, and spun-together tops of *Artemisia maritima*. The males always of the dull leaden type, the females reddish and more strongly marked; in some cases the fascia is very plain, in others only faintly shown.

Under the name "*viburnana*" I fancy it will be some day proved that two species are mixed together in this country.

T. pallæana, Hb.—A single specimen taken in a boggy place near Upminster, July, 1889. Not met with by me elsewhere in the county.

T. viridana, L.—Only too common (and destructive) in oak woods throughout the county; dozens sometimes coming down at nearly every blow from the beating stick. I have never been fortunate enough to meet with the pretty var. *suttneriana* in Essex.

T. ministrana L.—Pretty generally distributed, and frequently common; to be beaten from birch shrubs and flying over the same at early dusk at the beginning of June. I have never bred this species.

T. forsterana, Fb.—Larva common on ivy, and sometimes honeysuckle. The imago may often be beaten freely from the former at the beginning of July. Some of the females run very large. Does not appear to vary much except in the size of the spots.

Dichelia grotiana, Fb.—Common where it occurs, but seems to be a decidedly local species. I have found it on two or three occasions freely by beating a mixed growth of whitethorn and bramble on Wanstead Flats. Other localities are Upminster, Warley, and Fairmead Bottom, Chingford.

Leptogramma scabrana, Fb.—Used to occur a few years ago at Leyton, close to the spot now covered by the Town Hall buildings, where I used to beat it rarely from an elm hedge. Not met with elsewhere by me.

Peronea sponsana, Fb.—Very common in Epping Forest amongst beech and hornbeam, upon which the larva feeds. What is usually regarded as the type is very rare there; with one or two exceptions all of the many dozens I have examined belong to the very plain variety *lividana*, as described by Wilkinson.

P. schalleriana, L.—Not very common, but distributed widely. I have more often beaten it from blackthorn than anything else. The pretty var. *latifasciana*, Haw. (if, indeed, it is a variety, and not a distinct species), has occurred, but I have not met with it myself.

P. comparana, Hb.—By many entomologists considered merely a variety of the above, is not uncommon in many localities, but not, I think, quite so common as the previous species. I have bred it from a species of willow and also from blackthorn.

P. variegana, Schiff.—May be beaten in numbers from almost every hawthorn hedge in the district. All the named varieties occur, except *albana*, which I believe is more often found in the north of England. The almost black var. *cirrana* is the least common.

P. cristana, Fb.—Still to be found in limited numbers in Epping Forest, but in nothing like the numbers which were taken by the collectors of forty or fifty years ago in the neighbouring Hainault Forest, long since destroyed. I have not taken it anywhere but in the forest, where it may be beaten from hawthorn.

P. hastiana, L.—Not by any means common; a few larvæ have been found near Upminster, Barking, and (formerly) Hainault Forest.

P. umbrana, Hb.—Mr. Machin and others used to get it very sparingly in Epping Forest, but I have spent many hours in many seasons searching in vain for it.

P. ferrugana, Tr.—Common as this little species is in many places, it certainly cannot be called so in South Essex; indeed, I was collecting several seasons before I met with it at all! I have since found the larva sparingly on birch at Loughton, Warley, and Ingatestone. I have bred from them vars. *tripunctata*, *rufana*, Hb., and *gnomana*, Haw.

P. aspersana, Hb.—Decidedly local, but found in several places, of which I may mention Loughton, Upminster, and Woodford Bridge. In addition to its two usual food-plants, *Spiræa filipendula* and *Poterium sanguisorba*, I have found the larvæ on *Potentilla anserina* and *P. tormentilla*.

Rhacodia caudana, Hb.—Well distributed, but never very common, perhaps more common in the Brentwood district; I have beaten the pretty variety *ochracea*, St., from poplar at Warley, and the type generally from willow and alder.

Teras contaminana, Hb.—Often in hundreds, and in every variety in hedgerows and whitethorn bushes; some of the forms are very bright and pretty. I have bred it from larvæ feeding on flowers as well as leaves of whitethorn.

Dictyopteryx læflingiana, L.—Very common together with the vars. *plumbana*, Hb., and *ectypana* on oak trunks, and may be beaten freely from the boughs of the same wherever I have collected in the county.

D. holmiana, L.—Not very common; may be beaten early in August from hedges, especially those which contain a good quantity of brambles, on which the larva feeds.

D. bergmanniana, L.—Very common everywhere amongst wild and, to a lesser extent, cultivated roses; the larva in folded leaves of the same.

D. forskalearia, L.—Common everywhere amongst sycamore and maple, on which the larva feeds. May often be beaten out in large numbers from these two trees.

Argyrotoxa conuqayana, St.—Generally common, together with the var. *subaurantiana*, amongst privet, on which the larva is said to feed, but I have never bred it.

A. audouinana, Dup.—Local and rare. I have beaten out from oak (usually) a very few specimens at Loughton about the third week in June. Not met with elsewhere.

Ptycholoma leacheana, L.—In great abundance among oak, flying swiftly round the branches in the early evening. The pupa very common in the crevices of the oak bark, spun up in a white web.

Ditula hartmanniana, L.—Local, and by no means abundant where it does occur. By the River Lea in one or two places, at rest on young willow trunks. Much more abundant formerly, before so many of the willows on the banks of the river were destroyed.

D. semifasciana, Haw.—Another local species. I have found the larvæ on willow bushes near Warley, and beaten the imago from the same. Not met with elsewhere.

Penthina corticana, Hb.—Rather local, but not uncommon amongst its food-plant, birch. May be often found at rest on the trunks, but requires rather a sharp eye to detect it, owing to its colours matching the colour of the trunk. Brentwood, Warley, Ingatestone, Ongar, Wanstead Park, &c.

P. betulatana, Haw.—Found in the same localities and in the same way as the last, but much later; in fact, I have this year taken a worn specimen in September.

P. capraeana, Hb.—Local and scarce. I have beaten it from *Salix caprea* once or twice at Warley and near Upminster.

P. pralongana, Gn.—Another local and scarce species, occasionally beaten out of birch bushes at Warley and Ingatestone at the end of May.

P. pruniana, Hb.—Very common throughout amongst blackthorn. I once beat out a curious creamy variety exactly corresponding to the var. *nubiferana* of *cynosbatella*. This was at Box Hill, however.

P. ochroleucana, Hb.—Not scarce in hedges where plenty of its food-plant, wild rose, grows. I have occasionally taken it at light.

P. cynosbatella, D. L.—Very common throughout; larva polyphagous. Dock (!), whitethorn, blackthorn, apple, cherry, are some of its food-plants.

P. dimidiana, Tr.—The late Mr. Machin assured me that he once took a specimen at Loughton, but I fancy that, accurate as he was, there must have been some mistake, as its food-plant most certainly does not grow there.

P. gentiana, Hb.—Common in the larva state wherever the teasel grows, seldom seen (unless bred) in the imago state; the finest specimens I ever bred were from teasel heads gathered in the winter of 1890 on Canvey Island.

P. sellana, Hb.—Local, and from its dull colours and quickness of wing is often missed. I have taken a very few at Stanford-le-Hope, Thames Haven, Leigh, and Upminster.

P. carbonana, Dbl.—A single specimen captured by a friend in a boggy place near Upminster is the only record I have. The food-plant, *Stachys palustris*, is not uncommon on the spot. The allied species *fuligana*, Hub., I have not met with.

P. nigricostana, Haw.—Fairly common wherever its food-plant, *S. sylvatica*, grows. Larvæ may be found in the early spring in the dead stems.

Antithesia salicella, L.—Fairly common wherever willows are to be found; at rest usually on the trunks and sometimes on the leaves.

Hedya ocellana, Fb.—Very common, and in great variety throughout amongst whitethorn, on which the larva feeds in May.

H. lariciana, Zell.—Not rare in the Brentwood district on larch, on which tree the larva and pupa may be found. I have not taken it elsewhere in South Essex.

H. pauperana, Frr.—I may just mention this species, which has been taken rarely in North Essex, but so far not in the southern portion, I believe. I took a beautiful series in April last in this county (Surrey).

H. aceriana, Dup.—A little local, but common in many places among *Populus nigra* and other species of poplar; usually at rest on the trunks or any neighbouring fence.

H. dealbana, Fröl.—Very common wherever I have collected amongst poplar, oak, whitethorn, &c. The melanic var. *alnetana* not uncommon.

H. neglectana, Dup.—So often mixed up with the two preceding species by beginners, is locally abundant on willow trunks along the

Lea valley; I have also found it commonly in Wanstead Park and by the river at Chelmsford.

H. servillana, Dup.—A single specimen beaten from *Salix caprea* between Loughton and Epping is the only one I have taken in the county. My series in the cabinet I took in Kent.

Spilonota incarnatana, Hb., I have never met with, but the late Mr. Machin used to take it rarely in Fairmead Bottom, Chingford, amongst wild rose, and he also bred one specimen. This forest form is very large and brightly coloured.

S. trimaculana, Haw.—Common everywhere amongst hedgerows; the larva feeds in early summer in spun-together tips of whitethorn.

S. rosacolorana, Dbl.—Not rare, but often overlooked from its resemblance to the above. May be beaten from its food-plant, wild rose, and I have occasionally bred it from garden rose. Loughton, Chingford, Woodford, Upminster, may be mentioned as localities for this species.

S. roborana, Tr.—Very often too common amongst cultivated roses, clearing out the unexpanded flower bud, and is equally common amongst the wild species.

P. tripunctana, Fb.—Equally common amongst wild roses in nearly every place where I have collected.

Aspis udmanniana, L.—Amongst its food-plant, bramble, the larva may be collected freely, making a conspicuous bunch of the leaves by spinning them together and pupating therein.

Sideria achatana, Fb.—Fairly distributed amongst whitethorn; the larva, which in appearance and habits resembles *Rhodophaea suarella*, spins two or three dead leaves to a twig of the food-plant, coming out at dusk to feed. Loughton (commonly), near Upminster, Benfleet, &c.

Sericoris bifasciana, Haw.—Used to occur freely on a Scotch fir tree at Wanstead, but I have not seen it for several seasons; the larva was found feeding amongst the flowers early in June.

S. littoralis Curt.—Common amongst thrift in the salt marshes. Wakering, Thames Haven, Benfleet, &c.

S. abscisana, D. L.—Very local, near Tilbury, amongst its food-plant, *Carduus arvensis*.

S. cespitana, Hb.—I have only met with this usually common species on a rough, dry piece of waste ground near Upminster.

S. rivulana, Scop.—The late Mr. Machin told me that he used to take this species freely on one part of Wanstead Flats some forty years ago; it certainly does not occur there now, in fact, I have not seen a specimen in Essex.

S. urticana, Hb., and *lacunana*, Dup.—Both, of course, very abundant everywhere; the latter species is, I should say, about the commonest British Tortrix. I have taken rarely, on the railway bank near Harold Wood station, a beautiful reddish var. of the first species, but have not seen it for some years now.

"Mascotte," Whitehall Road, Thorton Heath:
October, 1901.

(To be continued.)

DESCRIPTIONS OF TWO NEW SPECIES OF THE GENUS *PLANEMA* FROM THE UGANDA PROTECTORATE.

By EMILY MARY SHARPE.

PLANEMA ARENARIA, sp. n.

Allied to *P. consanguinea*, Auriv., but distinguished from that species by the sandy buff ground-colour of both wings.

Primaries. Central area sandy buff, enclosed by a dark brown irregular band from the costa to just above the submedian nervure, this dark band having a second transverse band of sandy buff on the outer edge; the apical area and hind margin greyish brown; a faint brownish shading visible on the costal margin and in the discoidal cell. *Secondaries*. Ground colour sandy buff, relieved by nervular and internervular streaks of brown, from the hind margin to the discoidal cell; a border of greyish brown visible on the upper half of the hind margin, where it graduates down towards the inner margin; a cluster of black spots at the base of the wing. *Underside*. Similar to that of *P. consanguinea*. Expanse, 1.5 in.

The female does not differ from the male, with the exception that the ground colour is paler, as well as the brown markings mentioned above. Expanse, 1.7 in.

Hab. Entebbe, August (*F. J. Jackson coll.*).

PLANEMA DOROTHEE, sp. n.

Allied to *P. gea*, Fabr., and *P. esebria*, Hewits., but differs in having the apical band on the primaries much lighter in colour towards the costa. The hind marginal border on the secondaries is only indicated by a patch of brown on the apical area.

Primaries. Ground colour dark brown, relieved by a broad band of orange-buff on the apical area, but becoming almost white towards the costal margin; a similar patch on the inner margin also fades into white on the basal side; a small orange-buff streak is visible between the first and second median nervules. *Secondaries*. Ground colour orange-buff, a lighter tint occurring near the base; the usual broad hind marginal border only represented by a patch of dark brown on the apical area; the nervules with strongly indicated internervular streaks of dark brown. *Underside*. Closely allied to that of *P. esebria*; the black marking in and beyond the cell on the primaries more heavily indicated, the orange-buff markings showing more white than on the upper surface. *Secondaries* with the hind marginal border entirely absent; otherwise the spots and markings not differing from those of the allied species. Expanse, 1.5 in.

The female of this species differs from the male above described in having the spots and markings white, instead of orange-buff. Expanse, 1.7 in.

Another specimen agrees with the male, but has the apical band on the primaries white, as well as the minute streak situated between the first and second median nervules. Expanse, 1.4 in.

Hab. Entebbe, October (*Capt. H. B. Rattray*).

MISCELLANEA RHYNCHOTALIA.—No. 3.

By G. W. KIRKALDY, F.E.S.

Fam. REDUVIIDÆ.

* *TAPEINUS FUSCIPENNIS* (Stål).

Head and pronotum luteo-fulvous; base of elytra, legs, scutellum (except the rufo-flavous point), connexivum above and below, flavescens. Abdomen above pale brownish, apically flavescens. Sterna and abdomen below sordid dilute brownish red, more or less obscure, apico-laterally flavescens. Eyes and elytra black. Antennæ obscure fuscous. Head between the eyes a little wider than an eye. Posterior lobe of pronotum somewhat deeply longitudinally impressed, the impression closely and coarsely punctured. Second segment of antennæ five times as long as first, three-fifths longer than third.

♂. Seventh segment beneath (Verhoeff's nomenclature) very deeply ovally emarginate.

♀. Sixth segment obtuse-angularly emarginate beneath, medianly truncate apically; seventh angularly emarginate, somewhat obsoletely carinate medio-longitudinally. Long. 17-18 mill.

Hab. ASSAM: Chenapungi, Khasia Hills (coll. m. ex coll. Dom. Malcolm Burr). Stål described this from "*Patria ignota*."

† *RHYNOCORIS NITIDULUS* (Fabr.) var. *STROPHADES*, nov.

Differs from the type by the apically broadly luteous intermediate and posterior femora. The eyes are black, the anterior coxæ luteous. The abdomen above and below (except connexivum) more brownish.

Hab. Kongo (coll. m.).

I possess also an example of *R. nitidulus*, given to me by my friend Mr. Malcolm Burr, in which the left anterior tibia is shining black, the right anterior tibia dilute crimson. The locality is unknown.

Further notes on Vol. I. of Lethierry and Severin's Catalogue:—

P. 181.—*RHYNCHOCORIS HAMATUS* (Fabr.) is the type of the genus (= *humeralis*, Thunb.). "*Characteres generici e Rh. hamata descripti*" (Westwood).

P. 3.—*BRACHYPLATYS*, Boisd. 1835 = *Plataspis*, Westw. 1837 = *Platycephala*, Laporte, 1832.

P. 2.—*LIBYASPI*, n. n. = *Plataspis*, Leth. and Sev. (type, *coccinelloides*, Lap.).

Plataspis, Westw., is only a replacement of the preoccupied *Platycephala*, Lap., type *metallica*; unless *metallica* can be supposed to differ generically from *vanikorensis*, *Plataspis* should be regarded as a synonym of *Brachyplatys*.

* = *Sminthus*, Leth. and Sev. Cat. Hémipt. iii. p. 113.

† = *Reduvius*, Stål = *Harpactor*, Leth. and Sev.

have been a *Gracilaria*, except for the want of the special Gracilarian trophi. On obtaining these, in its first stage, it became a Gracilarian. On passing this specialized larval condition on to the second instar also, it became a *Gracilaria* or *Ornix*.

I have examined a number of species of Gracilarianæ (*Gracilaria* and *Ornix*), and find they all have two stages with Gracilarian trophi; and the same is the case with the two or three species of *Ornix* I have been able to examine.

Mr. Chambers only observed one Gracilarian stage in this group, but there are unquestionably two.

Even in the first instars the habits differ in different sections. *Gracilaria syringella*, for instance, with some half-dozen eggs laid in a row, has the same number of larvæ marching forward abreast for some distance before they form a blotch. *Gracilaria swederella* and *Ornix avellanella* make a narrow thread-like mine, which they lace to and fro into the pattern of a small square gridiron before throwing it into one square blotch, which they leave for a leaf-rolling, or perhaps I ought to say, cone-making existence.

In the genus *Coriscium*, which has always been associated with *Gracilaria*, I am familiar with *brongniardellum* and *cuculipennellum*, but on *sulphurellum* I made no observations. It is described as cone-making, and is therefore congeneric with *cuculipennellum*.

Cuculipennellum is a true *Gracilaria* in its early stages, having two Gracilarian instars, and afterwards inhabiting cones. Its mode of pupation is very special, as it makes a cone such as it makes for feeding in; inside this it slings its cocoon like a hammock, a structure very similar to, but more robust than, that of *Lyonetia clercella*, and it cuts out a little circular exit-hole in the wall of the cone precisely opposite the end of the cocoon.

Brongniardellum has a very different history; the larva makes a very large mine on the upper surface of an oak-leaf, and there are often two or three larvæ in a mine, but this is always the result of the coalescence of as many different mines, that happened to be in one leaf. It never leaves this mine until it does so to pupate, and so far does not differ from such a larva as that of *Gracilaria omissella*. It does differ, however, in a very fundamental point, viz. it has three instars of Gracilarian form.

In this it differs from all the other Gracilarias (*sensu stricto*), and is allied to the Lithocolletid division, to which it ought to be transferred.

Though never leaving the mine until it does so to pupate, it differs from such Gracilarias as *omissella* that do the same, in a respect that again unites it to *Lithocolletis* and separates it from *Gracilaria*. In feeding in its Gracilarian stages, *omissella* makes a very small mine like other Gracilarias, and afterwards, when armed with ordinary trophi, it mines in ordinary fashion beyond

the original Gracilarian mine. *Brongniardellum*, on the contrary, makes a very large Gracilarian mine, and in its later stages feeds entirely on the parenchyma so exposed, never in any way extending the mine, a habit which is exactly that of *Lithocolletis*. In separating these two species generically, the name *Coriscium* I fancy adheres to *cuculipennellum*. For *brongniardellum* we have the name *Acrocercops*, provided by Wallengren, whose diagnosis is founded entirely on imaginal characters.

In the European *Lithocolletis* we have a very homogeneous group; all of which have three Gracilarian instars, and all pupate in the mine. Amongst even these there is great variety of habit, both as to the mine itself, the way in which the larva contracts the thin epidermal cover, and in the pupating habits.

Lithocolletis typically separates merely the cuticle when in its Gracilarian stage, and thereafter eats the parenchyma so exposed, meantime contracting the cuticular roof by the silk spun on it.

There are, however, some, and possibly a good many, variations and complications of this habit, of which I may refer to one or two.

Lithocolletis stettinensis mines in alder leaves. It is stated to mine on the upper side, but in one respect it might be more correctly described as mining on the lower. It possesses three instars with flat Gracilarian head, and during these it mines not immediately below the cuticle, but at a lower level; rather, however, above the middle of the leaf, and leaving the ribs of the leaf in the lower half. When, however, in the fourth instar, with ordinary head, &c., it commences to eat; it attacks, not the thick lower layer, but the thin layer of green parenchyma that is attached to the upper cuticle, first eating in a longitudinal line, and as it clears off the parenchyma, spinning silk on the denuded upper cuticle.

The habit of *corylifoliella* is perhaps in some degree intermediate between this and the ordinary habit. *Corylifoliella*, as its first effort, enters a similar layer of the leaf to that in which *stettinensis* mines; but apparently, whilst still in the first skin, leaves this position and mines beneath the upper cuticle, and continues to work in both these mines, one above the other, for some time, a valvular slit in the veil of intermediate parenchyma affording access from the one mine to the other. It, however, leaves the deeper mine of comparatively small size, and extends the subcuticular one to large dimensions. When it assumes an ordinary head it eats the lower parenchyma, there being in fact no parenchyma attached to the upper cuticle. The round piece of intermediate tissue is separated from its attachment to the floor of the mine, and, dried up to a very flimsy scale, is attached to the cuticle forming the roof of the mine, and is covered over, with it, with the silk that contracts and pulls together the roof of the mine.

Chambers's observations, to which I have already called your attention, show that in America there are two other forms within the genus which certainly deserve, and have possibly received since Chambers wrote, generic recognition.

Our English form he calls the cylindrical form. It has three Gracilarian instars, and does most of its feeding as a larva of normal form in the fourth and following instars.

What he calls the flat form has five Gracilarian instars, and does all its feeding in these; in the two following it is only preparing for pupation. Why it should have an idle instar between the last feeding and the cocoon spinning instar, Mr. Chambers does not tell us, and there is something still to be learnt here.

A third section, consisting of only one species (*ornatella* = *ostensackenella*), agrees with the last group in everything except that it is the only species in the genus that leaves the mine for pupation.

I would suggest, if other names have not already been given to these two sections, that the flat group be called *Cameraria*, after Chambers, with type *guttifinitella*; and as regards *ostensackenella*, Fitch, I would place it provisionally in *Leucanthiza*, since the larval habits are identical. If imaginal characters forbid this, it will require a new generic name.

We finally reach the Phyllocnistinæ, in which we have the highest elaboration of the Gracilarian specialization, in so far that there are three Gracilarian instars, but no ordinary larval form afterwards. In the fourth instar the larval mouth-parts are reduced to a spinneret only as a functional organ; there are no functional jaws, either Gracilarian or normal.

Probably the *Cameraria* group of Lithocolletines are as far advanced, having no instar in which the larva feeds with ordinary jaws, and may be regarded as even more specialized in having five instead of three Gracilarian instars; but this, I think, has really an opposite bearing, as five or six is a normal number of moults, and a reduction to three is a very decided specialization.

In any case, however, I have no personal acquaintance with these American forms, and cannot go very far in theorizing about them.

The pupæ (Pupæ Incompletæ) of the lower Neo-Lepidoptera are characterized by having the 7th abdominal segment in the male free, though fixed in the female, and by the pupa leaving the puparium for the emergence of the imago. In the lowest surviving forms we have, the antennæ, wings, legs, &c., are but slightly held together, and equally slightly to the abdominal segments, and these appear to be free up to even the first; so that in Nepticulæ and Cochlidids the first six abdominal segments are all free.

As we advance to higher forms movement is lost in the anterior segment, and, as each segment loses freedom of movement, it tends to become also soldered to the appendages lying in front

of it. In the lowest Lepidoptera Aculeata (Adelidæ), as *Incurvaria* and *Crinopteryx*, we find only the 1st abdominal segment so fixed.

In the higher Lepidoptera Aculeata, in *Tischeria*, and some others. the first two abdominal segments are fixed. Then we come to the great mass of species with Pupæ Incompletæ, in which the first three abdominal segments are fixed. These include the true Tineæ, Cossidæ, Ægeriadæ, all the Tortrices and their allies, &c., as well as the Pterophorina, which are otherwise specialized. This seems to have been the structure of pupa that was most successful as a Pupa Incompleta—at any rate, it is the most popular. We then come to a Pupa Incompleta with the first four abdominal segments fixed. This is the pupa of the Gracilariadæ.

At this point in the evolution most lines of advance seem to have ceased to remain as Pupæ Incompletæ, and to have become Pupæ Obtectæ, *i. e.* they ceased to emerge from their puparia, and they acquired fixity in the 7th segment in the male, and became of the type of Pupa Obsecta that ranges throughout all the Macro-Lepidoptera, the Pyrales, Gelechids, Depressariads, Yponomeutids, Ecophorids, &c.

A Pupa Incompleta, with only two free segments (5 and 6, female; 5, 6, 7, male), seems to have been an unsatisfactory organism, and only obtained a permanent existence in the group we are considering—the Gracilariadæ.

It seems to me extremely probable that amongst the many exotic families of Micros, of which I am entirely ignorant, there is one or more with this pupal structure, attained quite independently of the Gracilariads; since it is a form, so to speak, quite in the highway of ordinary evolution in the Lepidoptera. Up to the present, however, I have not met with such a form.

The process of emerging from the puparium must be less easily performed with only two movable segments, and the tendency must have been very strong to go right forwards at once into the obsect condition.

The pupal condition of the Gracilariadæ is as definite in separating them from all other groups as is the larval one. And, of course, each of these is much more important, taken with the other, than it would be by itself. The larval specialization is so remarkable and unique, that by itself it may be taken as fairly sufficient to define the group, when we consider that there is no strong point—no point at all, in fact—*per contra*. The pupal condition is of very nearly the same weight in associating the species within the group, and delimiting them from others. Either by itself is adequate for this purpose; the two, taken together, are of course not simply twice as potent, but at least four times as potent.

(To be continued.)

NOTES AND OBSERVATIONS.

THE EMERGENCE OF *ANTHERÆA* FROM THE COCOON. — In reference to Mr. Dodd's note on this subject (*ante*, p. 16), I should like to say that in 'Australian Lepidoptera,' a work published in part by Scott and concluded by the Australian Museum, reference is made to the hooks with which the moth makes its exit in the following words:—"It was at this time our attention—being directed to the care of the numerous specimens in our possession emerging from the cocoons—was naturally attracted by the peculiar and loud noise produced by the imago in that operation for freeing itself, which led to a more careful observation, and to the discovery that the sound thus created was caused by two powerful hooked appendages of a horny substance placed one on each side, immediately at the junction of the base of the anterior wing to the thorax while in the act of tearing and destroying the strong fibrous texture of the nest, previously, however, moistened by a solvent fluid, until a rude and irregular aperture was made. During this action the insect maintained a slow rotatory motion until the hooks were plainly visible to us, appearing and disappearing alternately, and quickly and irresistibly calling to mind the sound produced by the gnawing of that domestic torment, the rat." He concludes by remarking that he found all the *Antheræa* were provided with similar hooks; and he also found them in two foreign species of Saturnidæ—i. e. *Tropæa luna* and *Telea polyphemus*. I myself have bred out several *A. astrophela* lately, but, unfortunately, have missed them when emerging. Vol. i. of Mr. A. W. Scott's work was published in 1864; vol. ii. in 1890-1893. — HENRY H. BURTON BRADLEY; 60, Margaret Street, Sydney, March 18th, 1902.

INSECTA OF SURREY. — In the first volume of the 'Victoria History of Surrey' over a hundred pages are devoted to the Insecta, and probably never before has so full a list been got together for any county: perhaps there is no other county for which, with our present knowledge, one equally ample could be prepared. In some cases we are given lists only of the species known, in other cases we have such lists with localities, while of a few orders—*e. g.* the Orthoptera, Neuroptera, Lepidoptera, and Homoptera—the lists are presented in narrative form, and these last we prefer. Those who have worked up a local list of any kind know how difficult it is to make it complete; but there is evidence that the work before us has in general been well done, and this record of Surrey insects may be looked upon as fairly complete, as far as our present knowledge permits. Everyone is of course aware that many additions must be made as time goes on, but that fact will not prevent the present list being of very great use to entomologists who reside or occasionally collect in Surrey, as well as to all who are interested in the distribution of species.

CAPTURES AND FIELD REPORTS.

ASPHALIA DILUTA IN CHESTER DISTRICT. — With reference to the statement in Mr. Arkle's "Notes from the Chester District" (*ante*, p. 117) that *Asphalia diluta* is new to the district, I may mention that I took the species in Delamere Forest, on Aug. 19th, 1893.—Geo. O. DAY; Parr's Bank House, Knutsford, April 14th, 1902.

EARLY APPEARANCE OF EUCHELIA JACOBÆÆ. — I am sending with this a specimen of, I believe, *E. jacobææ*. My wife found it creeping over the garden path, on the 9th inst. Apparently it had only just emerged, the wings being undeveloped. Last year I saw a moth on the wing which I believed to be *E. jacobææ*, and with that exception this is the first specimen I have seen in this neighbourhood—S. J. BEESTON; Shrubbery Hill, Cookley, Kidderminster, April 14th, 1902.

[The moth received from our correspondent is certainly an example of *E. jacobææ*. It was alive when it reached us, but the hind wings were still undeveloped.—Ed.]

LARVÆ OF COSSUS LIGNIPERDA AT VAUXHALL. — One morning towards the end of September last (the 25th, I fancy), I was surprised by the discovery of five or six full-grown larvæ of *C. ligniperda* in Vauxhall Park, South Lambeth. They were marching in a business-like manner along one of the gravelled paths, at regular intervals of a couple of yards or so, objects of great interest to the passers-by, who seemed to regard them as a new kind of centipede, and therefore as fair game. Two had already fallen victims. I managed to rescue the remainder and to place them in a position of safety. I also examined the trees in the vicinity as well as the attentions of the park-keeper would permit, but could find none that seemed to have harboured them. I am aware that the larva shows great restlessness when about to pupate, but this seemed very much like a migration in force. Possibly they had been disturbed by pruning operations.—J. B. TETLEY; 5, Wilkinson Street, Albert Square, S.W.

BUTTERFLIES IN MID-SURREY, EASTER, 1902. — Hybernated specimens of *Gonepteryx rhamni* were numerous on Easter Monday in the neighbourhood of Cranleigh, Surrey. I saw at least a dozen during a walk of two or three miles from that town. They were all males with one exception. Specimens of *Vanessa urticae*, *V. io*, and *V. polychloros* were also noticed.—J. B. TETLEY; 5, Wilkinson Street, Albert Square, S.W.

MARCH NOTES FROM KENT, 1902. — Very little collecting was done during the first part of March, but a good series of *Hybernia leucophaearia* was taken, principally from Bexley, including a fair sprinkling of the banded black and white form, and one or two females. *Anisopteryx æscularia* (males) was fairly common from the 9th, but only one *Phigalia pendaria* (*pilosaria*) was seen, and that a small male. I have never yet found this insect in any numbers about here, except in the larval state, and then almost invariably stung. For the first time for four years Easter was spent at home instead of in the New Forest. On the morning of March 29th we started to walk to Paul's Cray, but

the rain came down so hard and persistently that we were forced to beat a retreat. After lunch, however, we were off again, and considering the wretched weather, were much pleased with our takings. On a big lime-tree at Chislehurst we found a fine male *Amphidasys prodromaria*, and a few inches below it *Asphalia flavicornis*. We then proceeded to St. Paul's Cray Common, where we examined the birch-trunks, and were rewarded by a grand pair of *A. flavicornis* in cop., and three *Brephos parthenias*. This is the first time I have found the latter at rest. They were found on the small brown birches, in the forks of two branches, with the wings pressed tightly against them. One or two *Xylocampa lithorhiza*, *Anisopteryx aescularia*, and *Diurnea fagella* were also noticed. The same locality was visited in the afternoon of the next day, which was so miserably cold and dull that a single *Hybernia marginaria* (*progenmaria*), and a few *Xylocampa lithorhiza* and *D. fagella* were the only insects noticed. The Bank Holiday (March 31st), however, turned out a grand day, and St. Paul's Cray was again attacked. From 2 o'clock till 3.30, *Brephos parthenias* was flying in great numbers, but was, as usual, by no means easy to catch. Three of us succeeded in netting sixteen specimens in all, of which fifteen were males, mostly in good condition. A male *Gonepteryx rhamni* was tempted out by the sunshine, as were also three or four *Vanessa polychloros*, which seems to turn up in most unexpected places. *Taniocampa pulverulenta* (*cruda*), *Anisopteryx aescularia*, and *Diurnea fagella* were also noticed. We heard of another *Amphidasys prodromaria* taken that morning in Pett's Wood. With no night-work, and taking the weather into consideration, I think we should not have done any better in the New Forest. At any rate, the few hours' collecting compare very favourably with our three Easters there.—F. M. B. CARR; 46, Handen Road, Lee, S.E., April 6th, 1902.

SOUTH DEVON MICRO-LEPIDOPTERA.—At the time I wrote my notes on South Devon coast Lepidoptera I had put on one side several micros from there I was doubtful about. These have recently been determined for me by Mr. C. G. Barrett as *Gelechia semidecandrella*, (not uncommon at sugar), *G. mulinella*, and *Dicrorampha flavidorsana*. The last mentioned was taken at Starcross. As at least one of these has, I believe, not previously been recorded for Devonshire, it may be as well to place them on record.—GEO. T. PORRITT; Crosland Hall, Huddersfield, April 4th, 1902.

LEPIDOPTERA IN ROSS-SHIRE IN 1901.—The following is a list of a few Lepidoptera that I took last year in a mountainous part of Ross-shire, about the head waters of the river Carron. The Carron flows out at Bonar Bridge, on the east coast. My first visit there was for a few days about July 19th. The weather was excessively hot, and most of the insects were in poor condition as a result of a long spell of hot weather:—*Pieris napi*. *Argynnis aglaia*, not uncommon; only one was taken, and this at a high altitude, about 1500 ft. It is a male specimen, and decidedly dark. *Cenonympha typhon* (*davus*), a few everywhere about the hills, except on very high ground; nearly all were in poor condition; some of the females, however, were fresh out, and very pale in colour. *Xylophasia rurea* and the var. (?) *combusta*. *Miana*

fasciuncula, common at sugar; and different to the southern forms. *Noctua angur*. *N. rubi*, large in size. *Emmelesia cricetata*. *E. albula*. *Eubolia mensuraria*. *Gnophos obfuscata*, only one. *Larentia didymata*. *L. cæsiata*. *L. pectinitaria*. *Melanthia ocellata*. *Anaitis plagiata*. *Cidaria russata*, a female from which ova were obtained. The larvæ, to my surprise, hybernated when quite small, and have now (beginning of April) started feeding again. I was previously under the impression that this species wintered in the pupal state, while *C. immanata* does so in the egg state. *Coremia munitata*, several females were taken and these deposited eggs. The species was found from 1000 ft. in the valley to nearly 3000 ft. on the tops. From these eggs one imago resulted in the autumn, but the rest of the larvæ hybernated when about half grown, and they have not yet (beginning of April) made their appearance this spring, so I fear they are dead. *Scopula alpinalis* was very common on the tops wherever the right sort of ground occurred.

On my second visit to the same place, in September, I noticed the larvæ of *Lasiocampa callunæ* were common in places. These larvæ, which were about $1\frac{1}{2}$ in. long, were fond of sunning themselves on old bleached stalks of burnt heather. I brought away a good many, and they have successfully hybernated in an airy cage out of doors, and are now (beginning of April) changing their skins and beginning to feed again. *Celæna haworthii*, including one female found at rest on the heather. *Charæas graminis*. *Tapinostola fulva*, common. *Thera juniperata*, two specimens at rest on a juniper-bush, and the empty pupa-skin attached among the needles of the juniper. The juniper-bushes in this district grew quite prone along the ground and were scarcely noticeable, very unlike their erect habit in the South of England. *Cidaria miata*, one example on Sept. 29th. *Phibalapteryx lapidata*, three specimens on Sept. 11th. These were all that I saw, although I spent some time on succeeding days at the same place trying to find more. These three specimens were found about a grassy and rushy spot in a sheltered glen, at about 1250 ft. elevation. W. M. CHRISTY; Watergate, Emsworth, Hants.

DRAGONFLIES IN THE NORFOLK BROADS.—Mr. H. M. Edelsten has forwarded a notice of some dragonflies taken in June last. They were a pair of *Libellula fulva* (June 19th), the male with adult colouring; a pair of *Orthetrum cærulescens*, and another of *L. depressa* (June 20th), the male in each case adult in colour; several pairs of *O. cancellatum* (June 19th), but all the males of this species were immature. They were all flying in a quiet corner near a big reed-bed. In the afternoon he had been watching the female *L. fulva* hawking over a little bog-hole, when a male appeared and they copulated, and flew so close to him that he was able to net them both. *O. cærulescens* was also taken in cop. *O. cancellatum* was quite plentiful.

Records of some of the scarcer dragonflies are becoming plentiful, and the fear that several of them were disappearing from our midst seems to be quite unfounded. Will *Æschna isosceles* be given a better status during the season that is just commencing? It should be looked for in the broads and fens in June.—W. J. LUCAS; Kingston-on-Thames.

ODONATA OF PARIS. — The following species of Odonata were observed by me in the suburbs and environs of Paris, in the months of June and July, 1901 :—

Libellula quadrimaculata.—One specimen, Forest of Fontainebleau (captured). Others seen.

L. depressa.—Two specimens, males, Forest of Fontainebleau (captured). Others, all males, seen by one of the artificial lakes, Bois de Boulogne.

L. fulva.—One male, Chantilly. This handsome species is entirely new to my collection, and I had never seen it alive before. Like *L. depressa* and *Orthetrum cærulescens*, the male is of a lavender blue, the female of a tawny brown. Its abdomen is larger but somewhat narrower than is the case with *L. depressa*, and both longer and broader than that of *O. cærulescens*. It is by no means an easy species to secure. I went after one subsequently which alighted on the gravel sweep surrounding an artificial lake at St. Cloud, but failed to catch it. I also missed two (also males) that were flying about pools left by the rain in the lucerne field at Courbevoie. It is also possible that I saw it in the Bois de Boulogne.

Cordulia aenea.—One specimen, Forest of Fontainebleau. I imagined that this was quite new to my collection, but on my return home I found I had a second specimen from Basingstoke Canal, near Byfleet, a year or two since. I had mistaken it at the time for an *Æschna*.

Æschna carulea.—Not in my collection. If I am not greatly mistaken, I saw this species flying hither and thither over the lake in the Bois de Boulogne. The shape of its abdomen precluded the idea of its being a *Libellula*, and on the other hand it was not large enough to be *Anax imperator*.

Calopteryx splendens.—Two or three males seen, and one female captured by the canal, Forest of Fontainebleau. One male afterwards seen at Courbevoie.

Sympetrum striolatum.—One in the Parc Maison Lafitte.

S. flaveolum.—One specimen captured, Forest of Fontainebleau. I fancy it had not long emerged from pupa.

Lestes barbara.—Two specimens captured, Forest of Fontainebleau.

Agrionidæ :—Forest of Fontainebleau and Bois de Boulogne. There are in all probability one or more of the common British species, *Ischnura elegans*, *Agrion pulchellum*, *A. puella*, and *Enallagma cyathigerum*.—F. A. WALKER ; Dun Mallard, Cricklewood.

[Is Dr. Walker quite certain that he is not taking some other species for *C. aenea*—there seems so little resemblance between that species and an *Æschna* ? One would hardly expect also to meet with such a northern insect as *Æschna carulea* in the Bois de Boulogne ; might it not rather have been *Brachytron pratense*, or an early *Æschna mixta* ? Personally, too, I should hesitate to call *Agrion pulchellum* a common British species, though possibly it is generally plentiful where found at all ; but the known localities do not appear to be very numerous in Britain.—W. J. L.]

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—*March 19th, 1902.*—Dr. F. DuCane Godman, D.C.L., F.R.S., Vice-President, in the chair.—Mr. Benaiah W. Adkin, of Brandon House, Morden Hill, Lewisham; Mr. E. D. Bostock, of Texall Lodge, Stafford; Mr. Hubert Edelstein, of the Elms, Forty Hill, Enfield, Middlesex; Capt. Frederick W. Hutton, F.R.S., of the Canterbury Museum, Christchurch, New Zealand; Mr. Frederick William Lambart Sladen, of Ripple Court, Ringwould, Dover; and Mr. Gerard Orby Sloper, of Westrop House, Highworth, Wiltshire, were elected Fellows of the Society.—Mr. W. J. Kaye exhibited a number of insects from British Guiana, many of them taken by himself, illustrative of Müllerian mimicry. Dr. DuCane Godman remarked that in these regions many different forms of the same butterfly would often occur within a radius of fifty miles, showing a wide range of variation.—Professor E. B. Poulton, F.R.S., exhibited cocoons of *Malacosoma neustria*, collected by Mr. Hamm in 1900, spun upon black currant and apple trees in his garden at Oxford. All of them had been attacked by birds through the leaf, this being the thinnest part of the cocoon, and the pupa thus more easily abstracted. With regard to the resting habit of *Hybernia leucophearia*, he said that he had observed that this moth usually rested in a horizontal position. Dr. Longstaffe said that all the specimens he had observed on green stems affected a similar position, and that he had only found one on a birch tree. Mr. M. Jacoby said that he never found the species on oak at all, but on palings, also in the same position, which facts Professor Poulton said tended to show that the protective instinct of the species was retained in such localities.—Mr. G. T. Porritt exhibited two bred black *Larentia multistrigaria* from Huddersfield, and said that the dark form was rapidly increasing in Yorkshire. Of those already emerged and reared from the same brood, three were normal and two dark.—Dr. Frederick A. Dixey read a paper, illustrated by lantern slides, entitled:—"Notes on some cases of Seasonal Dimorphism in Butterflies, with an account of Experiments made by Mr. Guy A. K. Marshall." He said that he had long since formed the opinion that *Catopsilia crocale*, Cram., was specifically identical with *C. pomona*, Fabr., and had suspected that the differences between them might prove to be seasonal in character. The belief in their specific identity was held by Piepers and by De Nicéville, neither of whom, however, thought that the dimorphism thus shown had any relation to the seasons. In the discussion which followed, Colonel Yerbury said that a temporary rainfall in a dry season in dry places had a marvellous effect in producing intermediate and wet-season forms. Mr. F. Merrifield pointed out the difference between experiments upon tropical and European species. In the tropics there are not any very great distinctions of seasons and temperature, whereas in temperate climates the seasons are clearly marked off from one another. Professor E. B. Poulton expressed his opinion that by breeding species through, Mr. Marshall had proved that one form gives rise directly to the other; the pairing of the two forms being a biological test of very considerable value. Colonel Swinhoe, Dr. Jordan, and Dr. F. DuCane

Godman also joined in the discussion.—Professor E. B. Poulton read a paper on “Mimicry illustrated by the Sanger-Shepherd three-colour process,” supplementary to his paper read at the meeting of the Society on March 5th.—H. Goss and H. ROWLAND-BROWN, *Hon. Secs.*

SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—March 13th, 1902.—Mr. F. Noad Clark, President, in the chair.—Mr. A. L. Rayward, of Wallington; Mr. B. Stonell, of Clapham; and Mr. S. P. Harry, of Clapham, were elected members.—Dr. Chapman exhibited a number of species which he was placing in the Society's collections, including *Eupithecia consignata*, *Hyboma strigosa*, and *Jocheæra alni*, the first of which species was now only to be obtained in one very restricted private locality.—Mr. Kemp, living larvæ and perfect insects of the Coleoptera *Endomychus coccineus*, *Ptilinus pectinicornis*, and *Pyrochroa serraticornis*, the two former from Epping Forest, on hornbeam, and the latter from New Eltham, under moss.—Messrs. Harrison and Main, specimens of the dark var. *nigrofulvata* of *Macaria liturata*, from Delamere Forest.—Mr. F. M. B. Carr, a considerable number of specimens from the New Forest, including, Odonata: *Ischnura pumilio*, female vars. of *Pyrrhosoma nymphula*, *Agrion mercuriale*, and *Gomphus vulgatissimus*; Lepidoptera: a large number of species, among which were *Aventia flexula*, *Lithosia helveola*, bred *Gnophria quadra*, *Nola strigula*, *Triphena subsequa*, *Heliothis dipsaceus*, *Cleora glabraria*, bred *C. lichenaria*, *Selidosema plumaria*, and *Hyria auroraria*; eggs of the night-jar; a hornet taken from a hollow tree, Easter.—Mr. Nottle, examples of *Agrotis tritici* and *A. agathina*, from Keston.—Mr. Barnett, a living specimen of *Nyssia hispidaria*, female, from Chingford.—Mr. F. Noad Clark, two species of tick new to the British list. They were forwarded to him by Mr. Hewitt, of York, who found them upon guillemots on the Yorkshire cliffs. They had been identified, after considerable trouble, as *Ixodes fimbriatus* and *I. borealis*, both rare and little known species. He also exhibited the common *Ixodes redurivius* for comparison, together with photographs of *I. fimbriatus*.—Dr. Chapman, a living bred specimen of *Endromis versicolor* and some pupæ, in the larva-cases, of *Thyridopteryx ephemeriformis*.—Mr. Edwards, very fine examples of *Ornithoptera lydeus* and *O. socrates*, from the Malays, with *Parnassius imperator*, from Thibet.—Mr. Turner, a long bred series of *Macroglossa stellatarum*, from larvæ obtained at Bromley, Kent; and contributed notes on breeding and habits of the larvæ.—Mr. Lucas, a very large number of lantern-slides to illustrate his remarks on “Entomological localities.” They were chiefly of well-known spots in the New Forest.—Mr. West, of Streatham, also showed a few slides taken from several localities near London.—HY. J. TURNER, *Hon. Rep. Sec.*

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.—A well-attended meeting was held in the Memorial Hall, Manchester, on March 10th, Mr. Robt. Newstead, A.L.S., F.E.S., in the chair.—Mr. E. Whitley, of “Clovelly,” Sefton Park, Liverpool, and Oxford University, was elected a member. It was resolved that the next meeting be held in Liverpool, on April 14th, and that Messrs. F. C. Thompson, F. Birch, and E. J. B. Sopp be appointed a sub-committee to examine and

report on the condition of the library of the Society at an early date. A paper on Organic Evolution, with lime-light views, was communicated by Mr. William Hewett, President of the York and District Naturalists' Society, who, whilst dealing very ably with the subject in general, also made special allusion to many points of peculiar interest to entomologists, more particularly with respect to varieties in the Lepidoptera. An interesting discussion followed, on the melanism of *Amphidasys betularia* var. *doubledayaria* and other moths, in which the chairman, Mr. J. Ray Hardy, of Owens College, Dr. J. Cotton, Messrs. F. N. Pierce, B. H. Crabtree, G. O. Day, and others took part. On the motion of Mr. Pierce, seconded by Mr. E. J. B. Sopp, a hearty vote of thanks was accorded the lecturer for his paper. The fine display of exhibits included, amongst others, the drawing of an extraordinary abnormality in *Prionus californicus*, which was double in every limb; and a series of cases of Coleoptera by Mr. Ray Hardy; *Triphana interjecta*, *Noctua glauca*, *N. brunnea*, &c., by Mr. R. Newstead, on behalf of Miss Steele Perkins, of Rhyl; bone variety of *Arctia plantaginis* and var. *hospita*, by Mr. Harold Milne; *Orgyia pulchella*, by Dr. J. Cotton and Mr. F. C. Thompson; varieties of *Abraxas grossulariata*, *Elphyra*, &c., by Mr. B. H. Crabtree; two rare Dutch volumes with coloured plates by Sepp, and Lepidoptera varieties by Mr. G. O. Day; varieties of *Arctia caia*, by Mr. C. F. Johnson; *Arctia lubricipeda*, *A. urticae*, &c., by Mr. Herbert Massey; *Dianthæcia conspersa* by Mr. F. N. Pierce; Perthshire Coleoptera, and *Cælioxys mandibularis*, a hymenopteron new to the British list, by Mr. F. Birch; Hemiptera from Bolton, by Mr. Oscar Whittaker; *Anechura bipunctata*, an Armenian earwig, with the Caucasian variety *orientalis*, by Mr. E. J. B. Sopp.—E. J. BURGESS SOPP, *Hon. Secretary*.

BIRMINGHAM ENTOMOLOGICAL SOCIETY.—*March 17th*.—Mr. G. T. Bethune-Baker, President, in the chair.—Mr. R. C. Bradley exhibited a few Lepidoptera taken in Wyre Forest, including a pair of *Apamea testacea*, which had been taken *in cop.* at 3 p.m.; *Sesia ichneumoniformis*, *Myelois cribrella* (*cribrum*), *Euchloris pustulata* (*hajularia*), and *Hemithea strigata* (*thymiaris*).—Mr. J. T. Fountain, a series of *Lasio-campa quercus*, including local bred females from young larvæ taken in the spring and bred same summer; the specimens running from very light ones to quite dark ones; also some males taken “sembling” at Sutton, with wide light lines approaching var. *callumæ*. In answer to questions, he said that he had also taken full-fed larvæ of the same species at Sutton in the autumn.—Mr. A. D. Imms, *Lepisma saccharina*, taken in a kitchen at West Bromwich; it is one of our four British species of Thysanura.—Mr. C. J. Wainwright, photos of insects and parts of insects taken by Mr. Mearns, of Aberdeen.—Mr. G. T. Bethune-Baker, a drawerful of Lycaenidæ of the group Amblypodia, chiefly the genus *Archopala*, and gave an account of the same, explaining his theories of the origin of the various forms. He believes all were originally brown, and the more blue there is, the more recent the species, roughly speaking.—COLBRAN J. WAINWRIGHT, *Hon. Sec.*

RECENT LITERATURE.

Les Odonates du Continent Australien, par M. RENÉ MARTIN, in the 'Mémoires de la Société Zoologique de France,' tome xix. p. 220. Paris: 1901.

IN an article extending to twenty-nine pages M. Martin has given us a concise account of the Australian Dragonflies. Little worked as this region has so far been, still the number of species at least equals those known for Europe, and the number is likely to be added to considerably, whereas the tale for Europe is no doubt almost complete. Just as is the case with the higher animals of Australia, so it is with the dragonfly fauna—it has characteristics peculiarly its own, and we are not surprised to find that about a quarter of the known species are peculiar to that continent; and this individuality shews up even more clearly when reference is made to the genera. Several new species are characterized, and in some cases figures are given which will assist in the identification of them.

W. J. L.

E. P. FELT, "Insects Injurious to Elm Trees." (1902, Fifth Ann. Rep. Fisheries Comm. New York State, pp. 351-79; 3 coloured plates and 7 text figs.)

WE noticed (Entom. xxxiii. p. 254) Dr. Felt's report on insects injurious to maple; the present beautifully prepared memoir deals with the elm, and discusses and figures in their various stages the following insects:—*Galerucella luteola*, *Saperda tridentata*, *Magdalis armicollis* and *barbata* (Coleoptera); *Euvanesa antiopa*, *Thridopteryx ephemeraformis* and *Hyphantria cunea* (Lepidoptera), and *Gossyparia ulmi* (Rhynchota).

G. W. K.

General: H. GADEAU DE KERVILLE, in an exhaustive account of the marine and maritime faunas of a part of Normandy, enumerates 117 species of maritime insects viz. one Thysanuron (*Anurida maritima*), 4 Orthoptera, 65 Coleoptera, 8 Hymenoptera, 2 Lepidoptera, 21 Rhynchota, and 16 Diptera (including the remarkable *Clunio bicolor* discovered by the author). The two Lepidoptera are *Deilephila euphorbie* and *Zygana trifolii* which, with var. *orobi* and ab. *minoïdes*, is discussed in some detail ("Recherches sur les faunes marine et maritime de la Normandie; 3^e Voyage," 1901, Bull. Soc. Amis Sci. Nat. Rouen (for 1900), pp. 194-206). We are indebted to the same author for an extended résumé on "Galls and Gall-Insects" ("Les Cécidozoaires et leurs Cécidies," 1901, Causeries Sci. Soc. Zool. France, i. pp. 281-307; 2 plates and 1 text figure).

The remarkable genus *Koenenia*, of the Arachnid order *Palpigradi* is fully discussed by H. J. HANSEN ("On six species of *Koenenia*, with remarks on the order *Palpigradi*," 1902, Entom. Tidskv. (for 1901), xxii. pp. 193-240, plates 2-4). The same author has monographed the Myriapod order *Pauropoda* ("On the genera and species of the order *Pauropoda*," 1902, Vidensk. medd. naturh. foren Kjöben. (for 1901), pp. 321-424, plates i.-vi.). English students will congratulate

themselves that this Danish zoologist has contributed his latest three or four fine monographic memoirs upon the Arthropoda in their language.

Rhynchota.—T. PERGANDE works out very fully the interesting and complex life-histories of *Hormaphis hamamelidis* and *Hamamelistes spinosus* (1901, "The Life-history of Two Species of Plant-Lice," U.S. Dep. Agric., Entom., Techn. ser. 9, pp. 1-44; 23 text figs.).

Lepidoptera.—H. GADEAU DE KERVILLE discusses the copulation of Lepidoptera ("L'accouplement des Lépidoptères," 1901, Bull. Soc. Ent. France, pp. 76-81; 5 figs.).

Coleoptera.—The variability of the two-spot ladybird is considered by C. SCHRÖDER ("Die Variabilität der *Adalia bipunctata*, L., gleichzeitig ein Beitrag zur Descendenz-Theorie"; Illustr. Zeitschr. Entom. 1901, No. 24; 1902, Nos. 1 to 5; 1 plate and 5 text figs.).

G. W. K.

J. H. COMSTOCK AND CHUJIRO KOCHI, "The Skeleton of the Head of Insects." 1902. 'American Naturalist,' xxxvi., pp. 13-45; 29 text figs.

THE skeleton of the head, particularly in the more generalized forms, is discussed at some length. The authors consider that the existing nomenclature is "really of little morphological value; for but few of the primitive sclerites of the head have remained distinct, and some of them greatly overshadowed others in their development. The result is that in some cases a named area includes several sclerites, while in others only a portion of a sclerite is included." It is maintained that seven segments exist, with the following sclerites and appendages. "In each section of the middle column the dotted line indicates the division between the sternal and lateral elements of the segment."

SEGMENTS.	SCLERITES.	APPENDAGES.
1. Ocular (Protocerebral).	Vertex and genæ. Front.	Ocular sclerites.
2. Antennal (Deutocerebral).	Antennal sclerites. Clypeus proper.	Antennæ.
3. 2nd Antennal (Tritocerebral).	Labrum (Mouth). Postgenal.	2nd antennæ of Campodea et al.
4. Mandibular.	 Antecoxal pieces. Pharyngeal sclerites.	Mandibles. Trochantin (of do.).
5. Superlingual.		Superlinguæ.
6. Maxillary.	Maxillary pleurites. Lingua.	Maxillæ.
7. Labial.	Dorsal cervical sclerites. Lateral do. do. Ventral do. (Gula).	Labium.

G. W. K.

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CONTRIBUTION TO THE LIFE-HISTORY OF *LIPHYRA* *BRASSOLIS*, WESTW.

By F. P. DODD.

HAVING made many enquiries in Australia with reference to this remarkable butterfly without receiving any information of an important nature, it appears to me that little or nothing is really known of its life-history. One correspondent stated that it is "said to be found in ants' nests in its larval and pupal stages," but presumably he did not know which species of ant it was said to fraternise with. Another correspondent informed me that "his books gave it as a twilight flier, with a query, and that they suggested that larvæ may be carnivorous, feeding on woolly bugs."

I had already seen a female on a warm sunny day in July, 1900, depositing eggs upon a tree, which was in complete possession of the wonderfully interesting green tree ant, (*Eco-phylla smaragdina*, Fab., which exists here in vast numbers in the coast and mountain scrubs. Upon this tree there were several large nests of the ants, and the butterfly would rapidly fly over the top of the tree once or twice, then come underneath and settle on one of the branches near the trunk; there were four spots to which it returned at different times after its flights, and, upon examination, I found that there were two or three eggs deposited on each. Judging by the number of flights, I believe only one egg was laid at each rest. I have since frequently seen the eggs on other trees in ones, twos, or more; but deposits of two, in several different places, is the number usually to be met with. They are placed on the under side of branches, or protected side of the trunk. I took several of the ova, and in twenty-two days the larvæ, flat oval creatures, appeared, but of course refused to eat, and died. I had taken them upon the chance of their being leaf-eaters, and with the ants merely for protection, as I had found is the case with

several other Lycænids of ours—*Arhopalax* and *Hypolycaena phorbas*. Some weeks later I pulled the habitations of the ants to pieces, but could find no traces of larvæ from the ova left untouched, and was unsuccessful with many other nests examined. Then I made the enquiries alluded to.

During the next few months I examined scores of nests, in the hope of finding larvæ of this, to me, mysterious insect, but without success, and my efforts relaxed considerably. However, eventually I stumbled across a larva when searching an ants' nest for other insects. This specimen was half-grown, the size and shape being about that of a medium-sized lozenge, with a rim, as in a coin, bordering it all round, but raised somewhat along the dorsal surface; colour a very pale yellowish brown, seven dark spots on each side near margin, and across the centre of dorsal surface there were three furrows, reaching nearly to sides; these furrows are constant through all the moults—it must be borne in mind that I have not examined larvæ less than about one-third grown, those obtained from the ova were lost before I had noticed them particularly—nor do they disappear *even when the larval skin becomes the outer pupal shell*. The head, legs, and claspers are in a groove, the edges of which close down tightly all round, consequently they are seldom seen, except of course during progression, when the body is raised a little.

After this discovery, I met with other larvæ, generally larger and of a darker brown, and finally obtained pupæ, and bred out a series of the perfect insect.

I regret my inability to describe the ova, or the extraordinarily shaped larvæ and pupæ; but I trust, Mr. Editor, that you will kindly deal with these, for I send you specimens of same, with examples of the butterfly as it appears soon after emergence and when set—the set specimens, male and female, showing the white fugitive scales on fore wings.* I furnish, however, the following particulars, which may be considered deeply interesting:—

Taking several larvæ and supplying them with ant grubs of various sizes, I soon had the satisfaction of observing one individual approach a half-grown grub, deliberately seize it, and withdraw it from sight; but, being impatient, I turned him over soon after, and he slowly released his hold of the grub; unfortunately I failed to observe anything of the kind again. Finding that the caterpillars did not thrive upon ant larvæ alone, they were supplied with small nests containing ants and pupæ as well, but in a week or so they showed signs of sickness. By changing the ant nests, I kept several other caterpillars for

* We are obliged to our correspondent for the material he has so kindly furnished, and we are very pleased to add that Dr. Chapman has been good enough to undertake the examination of it, and will report thereon in these pages at an early date.—Ed.

nearly two weeks; they also became sickly, and had to be returned to nests on the trees. However, they deposited frass, showing that they had been feeding; this is small for such bulky creatures, is grey or greyish white, and is greasy-looking. So, though I cannot positively declare that they exist upon the ant larvæ, I am quite satisfied myself that they do. As five or even six caterpillars may be found in one nest, the quantity of food required by such large creatures must be considerable, though they are very slow growing; but the masses of ant larvæ could be drawn upon without making any great reduction in same. I cannot discern the mandibles of the caterpillar, and incline to the belief that when it comes to be thoroughly examined, the mouth-parts will prove to be of peculiar construction.

As many readers may be sceptical as to this insect subsisting upon ant larvæ, I may mention that at present I have young caterpillars of a moth (female, 20–25 mm.) feeding upon the larvæ of another species of ant which lives in the ground. When given the fresh grubs they soon take a lively interest in them, and affix themselves thereto, and appear to *suck* their victims. None of the grubs are eaten, but they are considerably smaller and much shrivelled when finished with. The moth is even more greasy than our butterfly. None of the grubs given to *L. brassolis* were eaten, but some had the same shrivelled appearance as those given to the moth larvæ.

Moulting.—When the caterpillars are about to cast their skins, they spin a webbed footing, nearly their whole length, to which they affix themselves rather firmly; but in many instances the ants, *utilising the web of their grubs*, secure them still more firmly to their position, the web reaching half-way to, or even up to, the rim. Whether this ant web is added with friendly intent, or with a view to fasten down a larva to get rid of him if possible, is a puzzling matter; still I have not met with any dead larvæ so fastened. Pupæ are occasionally treated in a similar manner, without the escape of the butterflies being prevented. The larger larvæ require three to four days after taking up their moulting position to crawl out of their old skins, which become a little darker, and finally split downwards under the front edge, and right and left along the rim. The old skin retains its shape above, and being relieved of its occupant, regains its former colour, so that, viewed casually, it is difficult to believe that it is an empty shell, as it resembles a real larva so closely.

When the larva is about half grown, the spots so plainly discernible upon young examples become much smaller, but can always be detected, even upon the pupæ. I have only observed the moulting process in several specimens about one-third grown, and in a fair number which had attained almost full size.

Change to the pupa.—The larval skin is not cast off, but changes in shape, and becomes a comparatively strong and outer

covering. The insect shrinks away from this and becomes detached, so that it can be shaken like an *Antheraea* pupa in its cocoon, or a nut in the shell. The true pupal skin is very thin and transparent, and, provided of course the outer shell is opened, the colour changes of the chrysalis can be observed plainly. After the larva has taken up its position for the transformation, there is no change for thirty-six hours or so, the first being a narrowing of the thoracic portion, with an increased thickness in same. Upon examining the future pupa at this time underneath, it will be noticed that the shell has closed in on each side, enveloping the head and legs completely; no closing in upon the prolegs occurs. For some hours no further alteration takes place, then the remaining portion of the creature contracts, accompanied by a considerable rise in the dorsal surface; the pupal change, so far as can be ascertained from outside observance, now being complete. However, without increasing the length of these notes, I think I can safely state from my experience that it is. For several days after, the shell is liable to split at the outside edge or rim if care in handling same is not taken, the whole of the top being liable to split and come off like a lid, and the chrysalis, being particularly delicate and pulpy, may be killed.

(To be continued.)

ACIDALIA MARGINEPUNCTATA, AB.



THE above figure represents an unusual form of *A. marginepunctata* (*promutata*). Mr. Lucas has so faithfully delineated the peculiar marking of this example that it is unnecessary to say anything beyond stating that the ground colour is grey. The specimen is one of two, both of the same form, taken in August last by Mr. J. P. Lawson, of South View, Clevedon, Somersetshire. They were flying at dusk on a hillside in the neighbourhood.

It may be interesting to add that Mr. Lawson, in reply to an enquiry respecting the ordinary form, writes:—"From what I can gather from other people, typical examples of this species have never been taken at Clevedon, the nearest locality in which it is found being Weston-super-Mare, which is some little distance from here."

RICHARD SOUTH.

NOTES ON THE GENUS *CLUNIO*,* HAL.

By A. D. IMMS.

DURING a short period of work last summer, while occupying the University of Birmingham Table at the Biological Laboratory, Port Erin, I met with some larvæ of a marine Chironomid, and have subsequently devoted a considerable time to working up what literature there exists upon the marine species of the family. The following notes which I have made upon the genus *Clunio* may not be perhaps without some value. Our only British species is in urgent need of further investigation, and probably, if carefully sought for, will not prove so rare as our present knowledge of it seems to warrant.

The genus was erected by Haliday in 1855 for a single species, namely *Clunio marinus*, the males of which he found on the shores of Kerry. It is characterised by the presence of a pair of enormous claspers—a feature which distinguishes it at once from any other Chironomid. In 1856 he recorded stray individuals of the species from Dublin Bay; in 1872 some examples were taken by Dale on the sea-coast at Hastings. From that time onwards until 1894 no contributions appear to have been made to our knowledge of the insect, and Theobald, in his

* As far as I have been able to ascertain, the following is a complete bibliography of the genus *Clunio* :—

1855. A. H. HALIDAY. Nat. Hist. Rev. vol. ii. Proc. p. 54, pl. ii.
 1856. ———. *Ib.*, vol. iii. Proc. p. 73.
 1856. J. R. SCHINER. Ver. Zoo. Bot. Ver. vi. p. 216.
 1864. ———. Fauna Austriaca, Die Fliegen (Diptera). Wien, vol. ii. pp. 593-4.
 1872. C. W. DALE. New and Rare British Diptera. Ent. Month. Mag. xx. p. 214.
 1892. F. V. THEOBALD. An Account of British Flies, pp. 195-6. London.
 1894. G. H. CARPENTER. *Clunio marinus*, Haliday,—A Marine Chironomid. Ent. Month. Mag. p. 129.
 1894. R. CHEVREL. Sur un Diptère Marin du genre *Clunio*, Haliday. Arch. Zool. Exp. et Gen. pp. 583-98.
 1897. H. GADEAU DE KERVILLE. Recherches sur les faunes marine et maritime de la Normandie, 2^e Voyage. Bull. Soc. Rouen, pp. 366-71.
 1898. A. GIARD. Sur l'appareil tracheen de *Clunio marinus*, Haliday. Compte-rendu Assoc. franc. (Congrès de Saint-Etienne), 1^{re} partie, p. 299.
 1898. J. J. KIEFFER. Description d'un Diptère sous-marin recueilli aux Petites-Dalles (Seine-Inférieure). Bull. Ent. Soc. Franc. pp. 105-8.
 1900. H. GADEAU DE KERVILLE. Description, par M. l'abbé J. J. Kieffer, d'une nouvelle espèce de Diptère marin de la famille des Chironomidés (*Clunio bicolor*), et renseignements sur cette espèce, découverte par M. Henri Gadeau de Kerville dans l'anse de Saint-Martin (côte septentrionale du département de la Manche) et trouvée par M. René Chevrel à Saint Briac (Ille-et-Vilaine). Bull. Soc. Rouen, 2 pp.

'British Flies,' is unable to supplement the work of Haliday. Coming to the year 1894, its rediscovery almost simultaneously by Carpenter (from Killiney Bay, Co. Dublin) and Chevrel (from the coasts of Calvados; he calls it *Clunio syzygialis*) filled some of the blanks in the life-history of the insect. Both these authors discovered the eggs, the larva, and the female. The eggs are narrowly spindle-shaped, and are enclosed, like those of *Chironomus*, in a gelatinous green tube. The larva is green, and possesses no ventral blood-gills; it lives among *Cladophora* and other algæ in the rock-pools, and is therefore truly marine. It is worthy of note that blood-gills are similarly wanting in *Chironomus oceanicus*, described by Packard (Proc. Essex Inst. 1868, pp. 41-46) from Salem Harbour, as well as in the larvæ I have met with at Port Erin, and in some of the fresh-water species. The female may be fairly described as apterous, for what remains of the wings is reduced to tiny vestigial appendages; she crawls about over the rocks and weed at low water, and during pairing the male flies about with her held in a straight line with his own body by means of his strong claspers. A full account of the habits of both sexes will be found in Chevrel's paper.* I might mention that in *Halirytus amphibius*, discovered by Eaton in Kerguelen Land, the wings are similarly vestigial; although placed in the Tipulidæ, Sharp considers that it is probably a Chironomid. The degeneration of the wings in the female has been described as the result of complete adaptation to a littoral habitat; for in so tiny and highly fragile an insect, if wings were present, the chances of being blown out to sea would be very great, and an appreciable numerical deterioration of the species would result from the destruction of the eggs. The mouth-parts are very rudimentary in both sexes, a feature which distinguishes the imagines from those of other Chironomids.

Besides *marinus*, two other species of *Clunio* have been described, namely, *C. adriaticus* by Schiner, who states that it is found on the sea-shore among sea products of all kinds, and that Fraunenfeld found it amongst colonies of *Mytilus minimus*; and *C. bicolor* by Kieffer from the French coasts.

Chevrel gives a few observations upon the internal anatomy of the *Clunio* larva, and Giard has described its tracheal system. Nothing is known of the anatomy of the imago.

In conclusion, I wish to state that I submitted this short article to Mr. G. H. Verrall, and I am indebted to his kindness in reading it through, and offering a suggestion upon it.

Zoological Laboratory, University of Birmingham.

* An interesting account is also given by Carpenter in 'Knowledge,' 1901, pp. 197-8.

THE CLASSIFICATION OF GRACILARIA AND ALLIED GENERA.

By T. A. CHAPMAN, M.D., F.E.S.

(Concluded from p. 142.)

In viewing the classifications that have been made of the Gracilariads, we have seen how they have always been placed close to the Lyonetiads, and usually more or less mixed up with them; in accordance, no doubt, with the fact that there is probably no very profound difference in any important character between them in the imago state. The superficial resemblance of *Leucoptera* (*Cemiosoma*) to *Phyllocnistis* is very close indeed.

I am not prepared to advance any larval characters that suffice to distinguish the Lyonetiadæ, but there is a very definite pupal character that is, I think, both inclusive and exclusive. This is that the pupa is entirely immobile, and in a special manner that distinguishes it from other immobile pupæ, such as *Perittia*, *Thyris*, &c. It has never passed through an ordinary obtect stage, in which the wings, &c., usually are attached down to the fourth abdominal segment only. Here the wings, &c., are attached for their whole length to the abdominal segments. In *Lyonetia* the wings and abdominal segments form one mass that tapers to a point—a point to which the wings, antennæ, and third legs reach, as well as the abdominal extremity. This mass is not, however, as solid as it looks. As in Pupæ Incompletæ, all the appendages separate from each other, and with rather the facility one finds in *Nepticula* than with the difficulty that one meets with, say, in *Tortrix*. When the appendages are pushed aside, one inclines to doubt whether they were really at all adherent to the abdominal segments, and these again are found to be quite movable. Still, it is tolerably certain that no movement whatever takes place in the living pupa, hardly even on dehiscence.

In *Leucoptera* the appendages do not come so far down, and the pupa itself is comparatively short and dumpy; still, it agrees with *Lyonetia* in essential structure. We have here, then, a pupa very different indeed from that of Gracilariads. But is it after all very far off from them, if its probable evolution is considered?

If we confine the name Obtect to those pupæ that have reached that character by the same route as, say, Noctuæ have, or by some very similar one, then the Lyonetiads are certainly not Obtectæ. They are a separate modification of the Pupæ Incompletæ. They are consolidated so far that the segments have lost mobility, but are still very primitive as regards the soldering

together of the different parts, appendages, &c. In this respect they appear to be lower rather than higher than the *Gracilariads*. *Gracilaria* is a Pupa Incompleta that has reached, as regards movable segments, the highest point that such a pupa can attain. *Lyonetia* has just passed this point, but is otherwise no higher than *Gracilaria*, whilst both are, as regards imaginal and other structures, still rather low amongst *Micros* above the *Tineæ*. Even pupally, as regards general soldering of appendages, they are lower than *Tortrices*, for instance, which in the matter of movable segments are a stage below them. Further, each in its own way is different from any other pupa.

Taking all these things into account, it is highly probable that the pupa of *Gracilaria* and that of *Lyonetia* are really not very far apart. Each has taken one step forward from a similar form, quite probably a common ancestor; but they have taken it in a different manner.

It might be asked if they be possibly so near as this, whether each form of pupa might not have arisen separately perhaps several times, and whether *Cemiostoma* might not possibly be nearer to *Phyllocnistis*, and *Lyonetia* to *Coriscium*, than *Lyonetia* to *Cemiostoma*, and *Phyllocnistis* to *Coriscium*. Apart from the inherent improbability of this, the larval specializations give it a complete contradiction.

The lateral pseudopods of the larvæ of *Phyllocnistis* and of *Cemiostoma*, and the curious tail-ending of the pupa of *Lyonetia*, and of the larva of *Phyllocnistis*, show that there is close relationship between the two groups, probably in the facility of developing such structures rather than in a common inheritance of them.

Phyllobrostitis daphneella is a very interesting species in several respects to us just here, chiefly in regard to its pupal structure. This places it outside the *Lyonetiadæ*, but very close indeed to it, if we accept the explanation of the pupal alliance that possibly exists between *Gracilaria* and *Lyonetia* that I have hazarded, and, indeed, very strongly enforces the probability of that explanation. At first sight the pupa, though darker in colour, and looking more solid, is very like that of *Cemiostoma*. A closer view, however, shows that it is of a form that I have described as occurring in *Epermenia* (Ent. Trans. 1897), at a time when that was the only one I knew with this structure, viz. with the free segments as in *Gracilaria*, but without the habit of leaving the puparium for emergence. This might very well be a connecting-link between *Lyonetiadæ* and *Gracilaria*.

The classifications that have recently been made of these groups may be taken to be well represented by Meyrick (1895), Spuler (1898), and Rebel (1901). These seem all to be founded more or less on characters of neururation, and the variations in the results are largely due to the personal equation by which each

systematist attributes a little more or a little less value to some slight variations of nervine arrangement.

We may accept the result so far as showing a strong probability that the Gracilariad and Lyonetiad families are somewhat related, and that the genera *Opostega* and *Bucculatrix* are more nearly related to them than perhaps any others of the European fauna.

Meyrick does not divide them into families, and the series of genera including *Lyōnetia* and *Gracilaria* reads continuously.

Interpreting this by his phylogenetic table (p. 708) by placing gaps in the list of genera, it is a little less unnatural than it looks; but when we go a little further, and find the connecting link between *Lithocolletis* and *Phyllocnistis* is the terribly impossible one of *Argyresthia*, we feel sure that that table has led Mr. Meyrick into one of the pitfalls such tables open in all directions, even for the most wary.

Mr. Meyrick, however, discussed all these genera rather fully in the 'Transactions' of the Sydney Linnean Society in 1881, with results that are but obscurely shown in his Handbook. He recognizes, from geographical reasons, that *Gracillaria* is an older form than *Lithocolletis*, and that the two groups are closely allied from their larvæ having the same number of ventral prolegs, viz. 6, in their post-Gracilarian stage. He does not, however, mention the Gracilarian trophi. I disagree with him when he places *Phyllocnistis* with *Cemiosoma*, as he does still, and in separating *Bedellia* from *Lyonetia*, and associating it with other forms that are outside this group.

It is rather outside this paper, but it may be noted that he then placed *Nepticula* high in this group, and in the 'Handbook' he places it at the top of the group containing our Gracilarians; whilst the wing-structure and the pupal development both show that it is as low as, or rather lower than, the lowest *Adelidæ* (Tineæ Aculeatæ), though on a different line. Apart from these points of disagreement, and taking into account that his classification is based almost entirely on imaginal characters, one admires the grasp he shows of the generic relationships, and how closely he approaches the true phylogeny. It must be remembered that, in taking my own results to be more correct than his, I am accepting his facts and conclusions to a great extent, whilst modifying them by other series of facts; and that but for the sound and masterly foundation laid by Meyrick, Chambers, and Stainton, my own contribution would have been of little effect.

Spuler and Rebel divide them into families. I am not in possession of Lord Walsingham's classification of these genera, beyond what I have been able to gather from a paper in the 'Proceedings' of the Zoological Society for 1897. From this it appears that he associates together *Bedellia*, *Bucculatrix*, and

Tischeria. Where he places *Phyllocnistis* does not appear, but I rather suspect in *Lyonetiadæ*. *Lithocolletis* he places under *Gracilarianæ*, but does not apparently subdivide it in any way. *Gracilaria*, however, is more or less subdivided, and several new genera are given. This arrangement does not quite accord with Meyrick's, which, however, as concerns the *Tineides* generally, he approves.

MEYRICK, 1895.

Opostega.
Bucculatrix.
Oinophila.

Lithocolletis.
Ornix.
Coriscium.
Gracilaria.

Leucoptera (*Cemiostoma*).
Lyonetia.
Phyllocnistis.

Bedellia.
Tischeria.
Ocnerostoma.

SPULER, 1898.

VIII. GRACILARIDÆ.

Gracilarinæ—*Gracilaria*.
Coriscium.
Ornix.
 Lithocolletinæ—*Lithocolletis*.
Bedellia.
Bucculatrix.

IX. ŒNOPHILIDÆ.

Œnophila.

X. CEMIOSTOMIDÆ.

Cemiostominæ—*Cemiostoma*.
 Phyllocnistinæ—*Phyllocnistis*.

XI. LYONETIDÆ.

Phyllobrostitis.
Lyonetia.
Opostega.

TINEÆ ACULEATÆ.

Tischerinæ—*Tischeria*.

REBEL (STAUDINGER), 1901.

GRACILARIIDÆ.

Gracilariinæ—*Gracilaria*.

Coriscium.

Ornix.

Lithocolletinæ—*Bedellia*.

Lithocolletis.

Palumbinæ—*Tischeria*.

LYONETIIDÆ.

Lyonetiinæ—*Lyonetia*.

Phyllobrostis.

Phylloenistinaæ—*Phylloenistis*.

Cemiosstoma.

Bucculatrix.

Opogona.

Opostega.

Of the various other genera associated with the Gracilariads and Lyonetiads in the several systems we have been considering, I may say that my knowledge of the early stages does not enable me to place *Oinophila*, *Opostega*, *Ocnerostoma*, *Palumbina*, or *Opogona*; but except *Palumbina*, if there be such a thing, I doubt whether any of them are Gracilariads.

Tischeria and *Bucculatrix*, about which I do know something, happen also to be those that have been most persistently placed here. Most certainly neither of them are either Gracilariads or Lyonetiads.

Spuler has so far recognized this, as regards *Tischeria*, as to take it right away, and place it in the Tineæ Aculeatæ, where also it is certainly out of place.

The pupa of *Tischeria* has only two fixed segments, though the third begins to lose freedom at the abdominal base, and is therefore at a much earlier stage of evolution than our Gracilariads, nor is the larva specialized like them. It is not an Aculeate, as it has no piercing ovipositor, nor has it spiculated wing-membrane. So far as my knowledge goes, I incline to place it alone in a family by itself.

Bucculatrix also wants the peculiar juvenile larval trophi, and the pupa is only a little in advance of that of *Tischeria*. It has the two basal segments fixed, and the third is all but fixed.

I should classify these genera as follows:—

GRACILARIAN COHORT.

- I. GRACILARIADÆ.—Larva with "Gracilarian" trophi in first two or more stages. Pupa Incompleta 1 to 4 abdominal fixed.

1. Gracilarianæ.—First two larval stages “Gracilarian.”
 - a. *Gracilaria*.
 - b. *Coriscium* (*cuculipennellum*).
 - c. *Ornix*.
 2. Lithocolletinæ.—First three or more stages “Gracilarian” 6 or 7 larval instars.
 - a. *Lithocolletis* (European group).
 - b. *Cameraria** (type, *guttifinitella*).
 - c. *Leucanthiza* (*ostensackenella*, Fitch).
 - d. *Acrocercops* (type, *brongniardellum*).
 3. Phyllocnistinæ.—Three Gracilarian stages and 1 modified normal stage (4 larval instars).
 - a. *Phyllocnistis*.
- II. PHYLLOBROSTIDÆ.—Pupa does not leave puparium, but 5 and 6 free, and 7 in ♂ (larva normal?).
1. Phyllobrostinæ.
 - a. *Phyllobrostis*.
- III. LYONETIADÆ.—Pupa immobile, fusion of parts feeble (larva normal).
1. Leucopterinæ. — Pupa with appendages shorter than abdomen.
 - a. *Leucoptera* (*Cemiosoma*).
 2. Lyonetianæ. — Appendages reach end of pupa, weakly fused.
 - a. *Lyonetia*.
 3. Bedellianæ.—Appendages to end of pupa, rather firmly fused.
 - a. *Bedellia*.
- Somewhere else, and at a lower level, but not together—
Bucculatrix.
Tischeria.

Bedellia is pupally very similar to *Lyonetia*, but has advanced to a much greater solidity and fixity of parts, sufficiently possibly to require that it should be placed in a separate subfamily.

MISCELLANEA RHYNCHOTALIA.—No. 4 (HETEROPTERA).

By G. W. KIRKALDY, F.E.S.

1. *ANTILOCHUS COQUEBERTII* (Fabr.).—Kangra Valley, India, 4500 ft. (G. C. Dudgeon).
2. *DYSDERCUS CINGULATUS* (Fabr.).—Red form; Kangra Valley, as above.
3. *D. RUFICOLLIS* (Linn.).—Curaçao (collns. Sceldrayers and mine).

* “Of or belonging to Chambers.”

4. *D. SUPERSTITIOSUS* (Fabr.). — South Africa; Transkei (G. C. Barrett).

5. *NYSIUS RAPHANUS*, W. R. Howard. — 1872, Phillips's 'Southern Planter' (sec. Riley), and 1872, 'Country Gentleman,' Sept. 15th (sec. Riley), and 'Canad. Entom.' iv. p. 409. = *N. destructor*, Riley, 1873, 'Fifth Missouri Report,' p. 113, fig. 41.

Riley admits (*l. c.* p. 111) that Howard's description was published before his own, and that the two names refer to the same species.

6. *SEPHINA VINULA* (Stål). — Jamaica (C. B. Taylor). The ground colour of the two examples I possess is as red as that of *S. maculata* (Dallas) from the same island. This species has not, I believe, been recorded before from Jamaica.

7. *MORMIDEA MONTANDONI*, sp. n.

This handsome little species combines the characters of the typical subgenus and *Melanochila*, Stål. It is separated from all the other described species (except *M. lugens* (Fabr.)) by the deflexed head and transversely callose-fasciate pronotum. From *M. lugens* it is distinguished by the colour of the head and bucculæ, the general picturation, and by the pronotal fascia being practically entire.

Bronzy black; tylus, lateral margins of head, anterior and lateral margins of pronotum, a submedian fascia and the latero-basal margin of the pronotum, the three sides of the scutellum, two lateral and a sublateral stripe on corium, clear pale yellow. Connexivum above and entire ventral surface (including antennæ, bucculæ, and legs) dilute fusco-testaceous. Abdomen beneath with seven obscure, slightly darker, longitudinal stripes at subequal distances apart. Membrane bronzy fumate. Femora and tibiæ speckled with black, apical half of third and the fourth segment of antennæ black, first and second more or less blackish. Head anteriorly somewhat deflexed; rostrum reaching to posterior coxæ, first segment to base of head. Antennæ short, fourth segment about three-fifths longer than the third, which is slightly longer than the second, which is two-thirds longer than the first. Head, pronotum, scutellum, and elytra (except the subcallose or subreflexed pallid parts) strongly impresso-punctate (the outer corial stripe sometimes somewhat sparingly so). Pronotum a little before the middle with a callose, *entire* (or almost entire) transverse fascia. Pronotum antero-laterally obtusely denticulate, lateral angles acuminate spinose. Scutellum not callosely spotted. Pleura sparsely punctured. Apical angles of abdominal segments acute, somewhat prominent. Long. $7\frac{1}{2}$ – $8\frac{1}{2}$ mill., lat. (across pronotal spines) $5\frac{1}{2}$ – $5\frac{3}{4}$ mill.

Hab. ECUADOR, Ambato (collns. A. L. Montandon and mine).

I have great pleasure in naming this well-marked species after my friend Mr. A. L. Montandon, our chief authority on some branches of the Cimicidæ.

GELASTASPIS, gen. nov.

Closely allied to *Ceratocoris*, White, and more especially *Libyaspis*, Kirkaldy, but differs from them by the form of the head (at least in the males).

Roundly convex. The upper surface, the head beneath, and the laminate parts of the sterna closely but irregularly punctured. Head horizontal, tylus small but distinct. Eyes small. Ocelli close to base of head. Bucculæ very short, elevated, anteriorly not touching clypeus. Head (with eyes) narrower than the apical margin of the pronotum; antennæ inserted a little nearer to the base of the rostrum than to the eyes. Head strongly callosely tuberculate between insertion of antennæ and intero-basal part of head, and also callosely elevated between the former and the eyes. Apical margin of pronotum widely and minutely emarginate, briefly truncate in the middle. Pronotum strongly elevated posteriorly, sinuately impressed in the middle on the anterior margin, lateral margins rounded. Prosternum strongly and profoundly depressed between the true sterna and the expanded laminate parts. Mesosternum laminate laterally. Stink-orifices simple, elongate. Coxæ almost contiguous. Spiracles at lateral margins of abdominal segments, not on connexivum.

♂. Tylus very short, juga meeting in front of the eyes, and produced somewhat overlappingly, about $3\frac{1}{2}$ times (or more) as long as tylus (to base of head); juga not forming a single curve together, the anterior margin of head being thus angularly emarginate in the middle. Antennæ very short, second segment one-half longer than the first, which is subequal to the third, fourth one-seventh longer than third. Distance between an ocellus and the nearest eye about three times as great as between the ocelli. Fifth abdominal segment (Verhoeff's nomenclature) beneath apically acutely emarginate, nearly touching apex of fourth in the middle; sixth beneath apically rotundately emarginate.

♀. Tylus more rounded, and shorter than in the male. From base of head to apex of tylus, scarcely shorter than the length of the juga in front of tylus. Eyes sessile. Second segment of antennæ about equal in length to the first. Distance between an ocellus and the nearest eye about seven-twelfths greater than between the ocelli. Apical margin of fifth segment of abdomen beneath obtuse-angled emarginate, sixth rotundately emarginate.

8. G. BROWNI, sp. nov.

Above flavescent or flavo-testaceous, irregularly speckled, blotched, and marmorate with blackish brown. Beneath black; the laminate parts flavescent, variegated as above. Antennæ, rostrum, legs, &c., pale rufo-testaceous. Abdomen beneath laterally more or less pallid in wedges. First segment of rostrum reaching to the middle of the prosternum, second to middle of mesosternum, third to middle of metasternum, fourth reaching beyond posterior coxæ. Long. ♂ 18-19½ mill.; ♀ 12 mill., lat. 9½ mill.

Hab. BRITISH CENTRAL AFRICA, Mlanji, Thornwood Estate (Henry Brown). On coffee, in company with *Antestia lineati-*

collis Stål (= *Aegaleus bechuana*, Kirk.), *Libyaspis wahlbergii* (Stål), &c. Of the last named, there is at present only a single mangled male, without scutellum; but I think the identification is correct.

I have great pleasure in naming this species after its discoverer, Mr. Henry Brown. The difference of head-structure in the sexes will separate the genus from *Libyaspis*, the only genus with which it can be confused. In *G. browni*, the length of the antennal segments, and of the head, &c., vary slightly; while the amount of dark blotching is much less in one male than in the other.

9. AMORGIUS CORDOFANUS (Mayr, 1852, larva), (= *niloticum*, Stål, 1854).—Kangra Valley, 4500 ft. (G. C. Dudgeon). Obliging-ly determined as *niloticum* by Mr. A. L. Montandon.

10. My friend Mr. E. P. van Duzee considers (*in litt.*) that I have fallen into error in placing *Liburnia* as a synonym of *Embolophpora* (Entom. 1901, p. 340). On looking again into the matter, I quite agree with him that *Embolophpora*, 1853, is not synonymous with *Liburnia* as understood by later authors. The five species included in *Liburnia* by him in 1866 (Hem. Afric. iv. pp. 179-81), however, belong to at least three genera, and no type is stated.

A LIST OF TORTRICES TAKEN IN SOUTH ESSEX BETWEEN 1885 AND 1901.

By A. THURNALL.

(Continued from p. 134.)

Roxana arcuana, L.—This beautiful insect usually occurs pretty freely wherever oak and bracken are growing together. I have still to learn how, where, and when the larva feeds, and upon which of these two very distantly related plants!

Euchromia purpurana, Haw.—Local, but occurs in several places, usually preferring rough uncultivated ground; not often in good condition when captured. Larva on roots of dandelion and other allied composites in May. Warley, Thames Haven (sea wall), Upminster, &c. My darkest and largest specimens came from Wicken.

Orthotania striana, Schiff.—Generally common in similar localities to the last; I have met with it in all the localities where I have collected. Larva feeds in the "crown" of the dandelion and other composites. The female is not so readily obtained, and is very much smaller.

O. (?) branderiana, L.—I have taken this in three localities: Wanstead (but not for some years), Ongar Park Woods, and in the neighbourhood of Colchester amongst aspen.

O. ericetana.—This species surely ought to be found, but I am obliged to confess that I have never seen a specimen alive either in Essex or any other county!

Eriopsela fractifasciana, Haw.—Rare and local; two or three specimens were taken by me some years ago in an open space in Epping Forest, somewhat to my surprise. I have bred it in May from larvæ taken at Box Hill the previous autumn, feeding underneath the radical leaves of *Scabiosa columbaria*.

Phtheochroa rugosana, St.—Not uncommon, flying at dusk in early June along hedgerows, and generally worn. The larva is more commonly met with in July and August, feeding in the fruit and shoots of *Bryonia dioica*. This insect should be killed at once, as it is usually very restless when boxed.

Cnephasia musculana, Hb.—Common generally; may be beaten, usually rather freely, in May from whitethorn and birch shrubs.

Sciaphila nubilana, Hb.—Often in swarms, the males only, round whitethorn and blackthorn (upon which the larva feeds in May). A species which soon gets worn, and is best bred, thereby ensuring a good set of females, which are not free fliers.

S. conspersana, Dougl.—Local, but occurs in a few localities on the coast; I have not met with it inland. Near St. Osyth, near Brightlingsea, and about fifteen years ago near Southend, on ground now covered with buildings, I believe.

S. subjectana, St.—Swarming almost everywhere; an old wooden fence skirting a dry meadow often finds a resting place for hundreds of this variable little moth.

S. virgaureana, Tr.—Common, but not nearly so much so as the last species; although commonly found with it at rest on fences, I have quite as often beaten it from oaks, &c.; the shelter afforded by trees seems to be more acceptable to this insect than to *subjectana*.

S. pascuana, Hb.—Distributed, but much more uncommon than the last species. I have found it on fences in the Lea valley, and bred it from larvæ found at Stanford-le-Hope in spun-together tops of milfoil. A very curious form of this insect occurs only in the salt marshes; pale yellowish, or straw colour, would roughly describe it. I have bred this from a folded leaf of *Aster tripolium*.

S. chrysanthæana, Dup.—Not common, but has occurred in many places. Near Upminster, Harold Wood, Warley, Leyton Marshes, may be mentioned. I found this larva on two occasions—the first week in June, 1890, and 1891, at Harold Wood, feeding on the leaves of *Tussilago farfara*, in some cases turning down a lobe of the leaf, and in others puckering the leaf by partly drawing two portions together with silk. Of course, I expected some common Pyrale to appear, possibly *lutealis*, and I was greatly surprised when this insect came out. About eight were bred.

S. sinuana, St.—Local, as, indeed, it seems to be everywhere. I have only taken it near Brentwood; a single male at rest on an oak, but a fair number of larvæ taken on what I expect is its only food-plant—viz. the spun-together flower-heads of the wild hyacinth (*Scilla nutans*). Eleven were bred this summer, and thirteen last year (1900). Some of the females are very fine.

S. (?) hybridana, Hb.—Fairly common; frequently found amongst elm bushes and blackthorns, on one or both of which I expect the larva feeds, but many hours have been spent in vain looking for it! I once bred a single specimen from a pupa spun up in a composite

flower, but I am inclined to think that the larva had merely gone there to pupate.

S. ictericana, Haw.—Very common throughout, often a nuisance when collecting at dusk. The larva is polyphagous. *Lychnis*, *Senecio* (three species), and *Aster tripolium* may be mentioned as common food-plants.

Capua favillaceana, Hb.—A true wood insect, common in many places; Epping Forest, Brentwood and Warley, Ingatestone, Upminster, &c. I have never met with the larva, but should imagine oak or hornbeam to be likely foods.

Bactra lanceolana, Hb.—Common in boggy places throughout, and in great variety. The larva may be found well on in May, feeding and afterwards pupating in the stems of *Juncus conglomeratus*.

B. furfurana, Haw.—Excessively local. I have only met with it in the marshes bordering the River Lea near Lea Bridge. Early in June it may be disturbed from its food-plant, *Eleocharis palustris*, in the stems of which it feeds and pupates. Its habits in all stages are exactly similar to *lanceolana*. I bred this species—for the first time in England, I believe—in 1894.

Phoxopteryx siculana, Hb.—Rare and local. One or two worn specimens beaten from *Rhamnus* near Brentwood. Mr. Harwood takes it more freely near Colchester, I believe.

P. uncana.—Pretty generally amongst ling and birch shrubs. Loughton, Epping, Warley, and several other heathy places.

P. myrtilana.—Hardly an insect one would expect to find in South Essex. Nevertheless I took a fine male at Temple Mills, near Stratford, near the railway sidings (June 22nd, 1890). I fancy it must have been conveyed from Yorkshire by one of the numerous goods-trains which run between Doncaster and London on the Great Eastern Railway.

P. lundana, Fb.—Not very common, but widely distributed. Double brooded. I have taken it near Stanford, Harold Wood railway bank, Loughton (rarely), Upminster, &c.

P. mitterpacheriana, Schiff.—Common generally amongst oak and beech, in the folded leaves of which trees the larva feeds in the autumn, pupating therein in the spring. A very beautiful species when fresh from the pupa.

P. upupana, H. S.—Scarce and local. Near Loughton, Warley, and near Ingatestone, always among birch shrubs, the food-plant of the larva.

P. lactana, Fb.—Another local species. I have found it not rarely in woods near Warley and Childerditch, also in Ongar Park Woods among aspens.

Grapholitha paykulliana, D. L.—Common amongst birch, the larva feeding in the catkins in the spring.

G. nisella, Clerck.—Fairly common, and very variable; on aspen trunks only (I have never found it on willow). The named vars. all occur. Wanstead, near Loughton, Ongar, &c.

(To be continued.)

NOTES AND OBSERVATIONS.

THE NATIONAL COLLECTION OF BRITISH LEPIDOPTERA.—As this collection in the Natural History Museum at South Kensington is now being rearranged, revised, and augmented, a convenient opportunity is afforded for making it what we all wish it to be, that is, thoroughly representative of the Lepidoptera of the British Islands.

One very important improvement would be the addition, in as much detail as possible, of the early stages of each species. It is hardly to be hoped, however, that this desirable end could be attained in any way approaching completeness without the assistance of the entomological public. We therefore venture to ask our readers to help the Museum to effect this useful work by contributing whatever material, either living or preserved, that they may have to spare. There are already larvæ and pupæ of a few species in the collection, but all the examples are not good, so that gifts of ova, larvæ and pupæ of any species would be acceptable. Lists of presentations, with names of donors, will be published in this Journal each month.

HEPIALUS HUMULI VAR. THULENSIS, Newman.—In these days of priority names, why should not justice be done to the distinguished first editor of the 'Entomologist'? Mr. Newman first named the Shetland form of *H. humuli* (Entom. ii. 162), and his name was accepted by Mr. Crotch in the same vol. p. 176. I often wonder why Mr. Jenner Weir, in the 'Entomologist,' vol. xiii. p. 250 (plate of *H. humuli* vars.), adopted the name *hethlandica*, Stgr., 1871, in preference to *thuliensis*, Newman, 1865.—C. W. DALE; Glanvilles Wootton. May 5th, 1902.

[See also Entom. xxvi. 100; and Staud. Cat. (3), i. 410.—Ed.]

CAPTURES AND FIELD REPORTS.

NEW FOREST NOTES (1902).—The last week in April this year was spent in the New Forest. We were favoured with wonderfully fine weather on the whole, but, though fine, a strong east wind prevailed, which was very bad for collecting. Treacle was tried on two occasions, but, except for a very few *Cerastis vaccinii*, and a large army of beetles and earwigs, nothing was attracted. Blackthorn blossom, of which there was plenty, was a trifle better, but very little. A few each of *C. vaccinii*, *Teniocampa cruda* (worn), *T. stabilis* (worn), and *T. gothica* (in fine condition) were observed at the blossom, with single examples of *Trachea piniperda*, *Xylina socia*, *Scopelosoma satellitia*, *Anticlea badiata*, *A. nigrofasciaria* (*derivata*), and *Hybernica marginaria* (worn). *Eupithecia abbreviata* common. On the wing the following additions were made:—*Pachnobia rubricosa* (one, in good condition), *Ligdia adustata* (one), *Selenia illunaria* (three males), *S. tetralunaria* (one male, unfortunately badly damaged), and *Anticlea nigrofasciaria* (one).

Day-work was none too good either. Butterflies were in fair numbers, especially the hibernated species. *Gonepteryx rhamni* was much in evidence, both sexes being well represented. *Vanessa polychloros*, common. *V. io*, five examples seen, the two specimens netted

being in wonderfully good condition. *V. urticae*, a few. Of the spring butterflies, *Pararge egeria* was the commonest, but though so freshly emerged, a good number had the wings torn. *Pieris rapae* occurred sparingly, as did *Cyaniris (Lycæna) argiolus*, and Mr. Lucas took *Syrichthus malva*.

By far the most interesting moth was *Boarmia cinctaria*, and the nice series obtained made up for any disappointment in other respects. It was certainly no easy work to get *B. cinctaria*, but three visits to Holmsley rewarded us with about three dozen specimens. Why this moth refuses to rest on the trees when they grow closely together is incomprehensible to me, but this certainly seems to be the case, for most of the examples taken were on the medium-sized stunted Scotch firs in the most boggy parts of the heath. On one occasion four moths were found on one tree, and this after more than an hour's searching without finding one. The darker-coloured moths seem to be the best protected, the light ones being frequently discernible at a considerable distance. About three-fourths of the moths taken were males. Some of the females were kept in chip-boxes, and deposited their eggs beneath the rough wood of the box, or between the rim of the lid and the outside of the box. In a natural state one would suppose that the ova are deposited in the crevices of the bark of the fir-trunks. Has it been observed whether they are deposited thus or on the food-plant? Besides the Holmsley specimens, two males were taken not far from Denny Lodge, one from a birch trunk.

Two examples of a *Tephrosia*, which I suppose would be *T. crepuscularia*, were taken from fir trunks. *Ematurga atomaria* and *Bupalus pinaria* were just coming out, and *Bapta taminata (bimaculata)* and *Panagra petrarvia* were taken singly, whilst a few fine examples of *Anticlea nigrofasciaria* were also obtained. Five species of *Eupithecia* were noted. Two nice specimens of the pretty and local *E. irrignata* were the best. *E. abbreviata* was common almost everywhere. *E. pumilata* was also fairly common, whilst *E. coronata* and *E. nanata* were each singly represented, the former being taken in the 'Rose and Crown' bus. *Xylina socia* was taken from a post. *Xylocampa lithoriza* was in fair numbers, but poor condition.

Turning to the larvæ, my father worked pretty hard with the beating-stick, and met with a fair amount of success, the following being obtained:—*Gnophria quadra* (two, very small), *Nola strigula* (one), *N. cucullatella*, *Halias bicolorana* (two), *Bombyx quercus* (one), *Porthesia similis*, *Miselia oxyacanthæ* (the commonest larva), *Catocala sponsa* (one), *Triphæna fimbria* (?), *Metrocampa margaritaria*, *Ellopia fasciaria (prosapiaria)*, *Thera variata*, *T. firmata* (?), *Oporabia dilutata*, *Rumia cratægata*, *Scodionia belgiaria* (?), *Cleora lichenaria* (about two dozen, some nearly full-grown). On the last morning a long search for the larva of *Limenitis sibylla* was well rewarded, as we took twenty-nine between us. The small brown larva was discovered on the brown stick of the honeysuckle just below the green shoot, generally rather low down in the bush in sheltered positions. Mr. Lucas found two on the green leaves, where they are fairly conspicuous, but on the brown stick they were splendidly protected.

It was rather early for dragonflies, but three female *Pyrrhosoma nymphula* were observed, and also a quite freshly emerged *Libellula*

depressa, resting on a grass-stem with the old nymph-case just below it. The nymphs of this species were in some numbers in the same pond.

A few Coleoptera were taken at odd moments, and Mr. S. W. Kemp kindly sent me the following list of species obtained:—*Pterostichus striola* (F.), *Dromius quadrimaculatus* (L.), *Deronectes depressus* (F.), *Staphylinus cæ sareus* (Cever.), found under stones and turf, *Anatis ocellata* (L.), *Coccinella septempunctata* (L.), *Byrrhus pilula* (L.), *Rhagium bifasciatum* (F.), *Helops striatus* (Fourc.), *Scyninus suturalis* (Thunb.), *Hylobius abietis* (L.), *Rhynchites æneo-irreus* (Marsh.), *R. paucillus* (Germ.), *Apion miniatum* (Germ.), *Balaninus villosus* (F.), and *Geotrupes typhaeus* (L.).

Cicindela campestris was seen commonly on the heaths, flying and running in the sunshine. Two species of Hemiptera also sent to Mr. Kemp were identified by him as *Podisus luridus* and *Acanthosoma griseum*.—F. M. B. CARR; 46, Handen Road, Lee, S.E., May 6th, 1902.

SPHINX CONVULVULI IN 1901.—In the 'Entomologist' for August, 1901, I recorded that Mr. Pestell, of Elstow, near Bedford, captured four specimens of *S. convolvuli* at honeysuckle on June 30th and July 2nd, 10th, and 11th. Mr. Pestell received from field-labourers two larvæ of *S. convolvuli* on August 16th, which pupated on August 22nd; one on August 28th, which pupated on September 2nd; two larvæ on September 7th, which pupated on 12th; one on September 14th, which pupated on the 16th. All these larvæ were found feeding on the scarlet runner, or french-bean. On October 4th he received a pupa which was found in a potato patch. These pupæ all failed to emerge, and are now dead. It appears to me to be probable that the specimens caught at midsummer were hibernated, and that these laid the eggs which produced the larvæ found in August and September.—W. GIFFORD NASH; Bedford.

SPHINX CONVULVULI ON DARTMOOR IN 1901.—At Yelverton, South Devon, at an elevation of about 800 feet, on the edge of Dartmoor, I captured, at tobacco flowers, two specimens of *S. convolvuli* on August 20th, two on 25th, one on 26th, and one on 28th. Many specimens were seen by others after I left the neighbourhood on August 31st.—W. GIFFORD NASH; Bedford.

NOTODONTA CARMELITA IN SOUTH OF SCOTLAND.—I was greatly surprised to find on April 19th last that a female specimen of *N. carmelita* had emerged in one of my breeding pots, which contained pupæ from larvæ collected in this locality during the last week in July and first week in August, 1901. The larvæ were collected from birch and black poplar. I knew that I had *dictæa*, *dictæoides*, *dromedarius*, and *ziczac* among those larvæ, but never suspected that I had *carmelita*.—J. C. HAOGART; Galashiels, N.B., May 3rd, 1902.

PLUSIA MONETA LARVÆ AT FARNBOROUGH (KENT) AND NEIGHBOURHOOD.—Last season I had the good fortune to capture some imagines of this species at Bromley Common (*ante*, Entom. July, 1901). There is a considerable quantity of its food-plant in the neighbourhood (*Aconitum* and *Delphinium*), so this year I resolved to look for the larvæ. A diligent search (mostly on private ground) resulted in the capture of a good number, spun up in bunches of terminal leaves, undergoing

their last moult. A friend of mine has also found two in his garden at Tooting, S.W.—A. J. LAWRENCE; 65, Malyon Road, Ladywell, S.E., May 19th, 1902.

LARVÆ IN DURHAM.—This year has been one of the most successful years for larvæ I have had. We have taken within a very few miles of Newcastle-on-Tyne about fifty larvæ of *Triphana fimbria*, one hundred of *Argynnis euphrosyne*, eighty of *Eupithecia tenuiata*, and one of *A. selene*. These figures are rather remarkable, for the local records say that *A. euphrosyne* is disappearing from this district, and similarly with *A. selene*. We obtained larvæ of the two Argynnids mentioned in about two hours, for we only sought one day.—J. W. HARRISON; 1, Craig Street, Birtley, R.S.O., Durham, May 19th, 1902.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—April 16th, 1902.—The Rev. Canon Fowler, M.A., D.Sc., F.L.S., President, in the chair.—Mr. James Roland Charnley, of Howick House, Howick, near Preston, Lancashire; and Mr. A. T. Gillanders, of Park Cottage, Alnwick, were elected Fellows of the Society.—Mr. O. E. Janson exhibited specimens of both sexes of *Ornithoptera victoria*, from Ysabel, Solomon Islands, recently taken by Mr. Albert Meek; and remarked on the variation in the colour and markings in the males.—Mr. H. W. Sheppard-Walwyn exhibited variations of *Euchelia jacobæ* taken by him at Winchester in July, 1889.—Mr. Willoughby Gardner exhibited *Calioxys mandibularis*, Nyl., from the Cheshire coast, a species new to Britain; and *Osmia xanthomelana*, male and female, and *Osmia parietina*, Curt., male and female, from North Wales.—Mr. A. J. Chitty exhibited a specimen of *Aglaia urtica* taken at sallow on March 28th, having a large portion of the hind wings cut off, so that when folded they were symmetrical in outline. From their appearance he concluded they had been bitten off by some animal, probably during hibernation.—Dr. T. A. Chapman called attention to the remarkable bilateral asymmetry in the male appendages of the Hemarid Sphinx, *Cephonodius hylas*, Linn. He said that bilateral asymmetry in insects was sufficiently rare to make it always notable. In the male apophyses of Lepidoptera he had only been able to find records in the case of the Hesperid genus *Thanaos*, to which Scudder and Burgess first called attention—though it seems highly probable that the facts can hardly have been unobserved in so common a species as *C. hylas*. In *hylas* the right clasp is larger, rounded, but very imperfectly articulated to the base, so as to be capable of very little movement, otherwise, and compared with other Hemarid genitalia, one would call this the normal clasp. The left clasp looks at first as though it had been the same as the right, but had met with some accident that had removed a large terminal disc, leaving two lateral cusps. It is shorter than the right as about three to five, and the arrangement of bristles and spines is quite different to that on the right, if it is indeed possible to compare these very different forms. It is much more movable than the right clasp. The arrangement suggests that it is intended to

facilitate a lateral, instead of a medial approach in the capture of the female. The upper appendage or tegument is also twisted, so as no doubt to correspond with the obliqueness of the whole appendage, as most definitely seen in the clasps. Dr. Chapman also exhibited specimens removed from the insect, and also of the several parts, as well as a rough sketch of the clasps and tegumen.—Mr. C. P. Pickett exhibited *Hybernina leucophæaria* taken during March at Chingford, Highgate, and Finchley, including the ordinary mottled, the black and white banded, and six very deep chocolate-coloured forms, one unicolorous. He also showed series of *Phigalia pedaria*, *Anisopteryx æscularia*, and *Nyssia hispidaria*, from the North Metropolitan district.—Mr. H. J. Turner, on behalf of Mr. W. West, of Greenwich, exhibited specimens, males and females of *Stictocoris flaveola*, Bohm., a species new to the British fauna, found amongst long grass in damp places at Lee, Kidbrook, and Shooter's Hill. He also exhibited several specimens of *Typhlocyba candidula*, Kir., a species first discovered by Mr. West at Lewisham and Blackheath on *Populus alba*, and remarked that it was interesting to find two quite new species occurring in the district so well worked by Douglas and others in years past.—Dr. D. Sharp, F.R.S., communicated a paper by Miss Alice L. Embleton, B.Sc., entitled "On the Economic Importance of the Parasites of Coccidæ."—Colonel Charles Swinhoe, M.A., F.L.S., read a paper entitled "Eastern and Australian Drepanulidæ, Epiplemidæ, Microniidæ, and Geometridæ in the British Museum Collection." Mr. William F. Kirby, F.L.S., contributed a paper entitled "Additional Notes on Mr. Distant's Collection of African Locustidæ."—H. ROWLAND-BROWN, *Hon. Sec.*

SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY. — *March 27th, 1902.*—Mr. F. Noad Clark, President, in the chair.—Mr. Stanley Edwards exhibited (1) very fine specimens of Ornithoptera, *O. bormanni*, *O. naias*, and *O. criton*, from the Malay Peninsula, and a male of the rare *O. plateni*, from New Guinea; also a large collection of Hemiptera-Heteroptera from all parts of the world, comprising seventeen genera and eighty-five species.

April 10th.—The President in the chair.—Mr. Main exhibited a twig of hawthorn from the New Forest, having a large batch of ova of *Eriogaster lanestris*, and remarked on the curious spiral arrangement of the eggs.—The Rev. F. P. Perry, a large number of specimens collected during a short residence in South Africa, including a large and conspicuous ant-lion, several species of cockroach, clusters of *Mantis* eggs from the gum-trees, numerous species of Coleoptera—especially Longicorns—and a very large species of the Hemiptera. He specially pointed out a large beetle which had powerful stridulatory organs at the back of the pronotum.—Mr. Moore, some ten species of exotic Blattodea, including *Blabera gigantea*.—Mr. Kemp, a macropterous example of *Hydrometra stagnorum* from Mitcham.—Mr. Hewitt and Mr. Nottle, long bred series of *Nyssia hispidaria* and *Amphidasystrataria*, both from Epping Forest parents; and a number of *Phigalia pedaria* from West Wickham.—Mr. Edwards, a collection of Hemiptera-Heteroptera mainly from South America, and a number of species of the genus *Charaxes*, including several fine examples of *C. jasius*.—Mr.

Lucas, specimens of *Eriocrania subpurpurella*, which he stated was now common at Oxshott on fences.—Mr. Clark, microscopic slides showing details of structure of *Corixa striata*, *Orgyia antiqua*, &c.—Dr. Chapman, specimens of *Ræstlerstammia exalebella* bred from larvæ beaten by Mr. F. M. B. Carr at Oxshott on birch; he also gave notes on its habits and occurrence, and made remarks on the spelling of its specific name.—Mr. South, a curious banded form of *Acidalia marginepunctata*, from the hills round Clevedon, and a large number of species of British and Eastern Asian Lepidoptera, the latter to illustrate his paper entitled “Some British species of Lepidoptera and their Geographical Distribution.”—HY. J. TURNER, *Hon. Rep. Sec.*

BIRMINGHAM ENTOMOLOGICAL SOCIETY. — April 21st. — Mr. G. T. Bethune-Baker, Vice-President, in the chair.—Mr. R. C. Bradley showed the following species of Aculeate Hymenoptera from Wyre Forest:—*Pompilus cinctellus*, *Agonia hircana*, *Pseudagenia punctum*, and *Stelis aterrima*, all being new to the district.—Mr. C. J. Wainwright, a small collection of Diptera made by Dr. T. A. Chapman in Spain last year, chiefly in the Sierra Albarracin. Amongst the most interesting were *Volucella elegans* (originally described from Spain), *Physocephala chrysorrhæa*, *Anthrax velutina*, *Systachus leucophæus*, *Holopogon clavipes*, *Cyrtus gibbus*, and a series of a species of Tachinid of the *Plagia* group, which had been bred from *Albarracina korbi*, and appears to be quite new and very distinct.—Mr. W. H. Flint, a long series of *Brephos notha*, taken in the Forest of Dean last Easter Tuesday. The species was quite common, flying chiefly round the aspens, and he noticed that they did not appear to come to willow blossom at all as *B. parthenias* does.—Mr. Bethune-Baker, a number of Lycenidæ from South Africa, of unusual colours and patterns for the family.—Mr. W. H. Flint gave an account of the wings of Lepidoptera, their structure, development, &c.

CORRECTION.—The *Apamea testacea* mentioned in last report (*ante*, p. 150) were from Moseley, and not from Wyre Forest as there stated in error.—COLBRAN J. WAINWRIGHT, *Hon. Sec.*

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY. — The usual monthly meeting was held on April 14th, in the Royal Institution. Dr. J. W. Ellis, F.E.S., occupied the chair.—The following gentlemen were elected members of the Society:—Mr. Hy. Champ (Manchester), Mr. Benjamin Jones (Levenshulme), Mr. W. Raper (Levenshulme), and Mr. J. T. Wardley (Knotty Ash). Mr. R. Wilding proposed that the evening meetings be adjourned until October next; Mr. Webster seconded, and it was carried.—Mr. Wilding further proposed that a field meeting be held in the summer, the arrangements to be made by the secretaries; Mr. Pierce seconded, and it was carried unanimously. Mr. F. N. Pierce, F.E.S., read a paper on the British Pulicidæ, which was communicated by Mr. G. C. Bignell, F.E.S., and was well illustrated by the micro-lantern.—The following exhibits were examined:—A small collection of Coccidæ, by Mr. R. Newstead; micro-slides of Pulicidæ, by Mr. Pierce; *Biston hirtaria*, by Mr. W. A. Tyerman; Coleoptera from Mossley Hill, by Mr. G. A. Dunlop; Coleoptera, including species new to the district, by Mr. Wilding; and *Cymatophora flavicornis* mounted in the natural position on a branch of the food-plant (*Betula alba*), by Mr. Fred. Birch.—FRED. BIRCH, *Joint Hon. Sec.*

RECENT LITERATURE.

H. KOLBE, "Gartenfeinde und Gartenfreunde, die für den Gartenbau schädlichen und nützlichen Lebewesen." Gartenbau Bibliothek, Band 34-36; pp. 1-320, and 76 text figures. Karl Siegismund, Berlin (preface dated June, 1901).

This useful little book may be compared best, perhaps, with Dr. John B. Smith's 'Economic Entomology' (1896). The arrangement, however, is quite different, the present work discussing the pests under the heading of their food-plants, instead of in systematic order.

After an introduction upon the structure of the insect frame, and an account of the principal economic orders and families, with analytical tables for their further identification, preventive measures and remedies are briefly discussed. The more important plants are next considered, with an account under each of their various pests, *viz.* divers fruit-trees, strawberries, vegetables, and ornamental shrubs; a considerable amount of otherwise scattered information is here gathered together. The second part deals with the gardener's friends—beasts, birds, ichneumon-flies and others.

The author's name is a guarantee of the accuracy of the entomology, while the illustrations, most of which are from the pencil of Dr. Rübsaamen, are clear and well-selected. The book is plainly but substantially "got up," and the printing (which is in the German character) is wonderfully clear.

G. W. K.

A. D. MICHAEL, "British Tyroglyphidæ," vol. i. pp. v and 291; 19 partly coloured plates (Ray Society, 1901).

A COMPANION volume to the author's "Oribatidæ," and deals with the Acari of which the "Cheesemites" are the type.

This first volume contains a history of the literature; criticism on recent classifications of the Acarina; followed by detailed accounts of the anatomy and development, and a systematic account of a portion of the family. In the forthcoming second volume we are promised the continuation of the systematic account and a bibliography of the literature.

Although so minute—one thirtieth of an inch being the length of a very large species—the Tyroglyphidæ are of considerable importance. The number of known species is very few, some fifty being recognized, and these mostly very widely distributed; yet many of them "swarm in such countless myriads . . . that the mind shrinks from any attempt to estimate their numbers, even in a small space." They are enormously destructive to cheese, flour, hay, and druggists' stores; sound healthy bulbs as well as rotten ones, and dried fruits, attest their ravaging powers. Biologically, however, the Tyroglyphidæ are specially remarkable for the possession of a "*Hypopus*-stage." The "*Hypopi*" are heteromorphous—comparatively rarely occurring—nymphs (of both sexes) which are not true parasites, but only attach themselves to any suitable moving creature for purposes of transit. This *Hypopus*-stage was for long an enigma, but was elucidated by the author in 1885, and is now fully discussed in the sixth chapter. We must not omit mention of the nineteen plates containing 241 beautiful drawings by the author, of which forty-five are coloured. They are beyond all praise.

G. W. K.

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ADDITIONS TO THE FAUNA OF MEXICO (BEES AND COCCIDÆ).

By T. D. A. COCKERELL.

PROF. C. H. T. TOWNSEND has this year been exploring parts of the State of Chihuahua, and has brought to light the following forms, new to the Mexican fauna.

APOIDEA.

Melissodes tristis malvina, n. subsp.—♂. Similar to *M. tristis*, but smaller (length about $8\frac{1}{2}$ mm.); eyes dark brown (pale greenish or greyish in *tristis*); antennæ with the flagellum dark reddish beneath (bright ferruginous in *tristis*); nervures of wings mostly piceous (ferruginous in *tristis*); pygidial plate narrower; otherwise as in *tristis*. The clypeus, labrum, and mandibles are black, as in *tristis*.

Hab. Cerro Chilicote, State of Chihuahua, Mexico, at mouth of cañon on south side, March 22nd, 1902, at flowers of a species of Malvaceæ, apparently one of the purple species of *Sidalcea*. Collected by C. H. T. Townsend.

The following table separates the males of *Melissodes* in which the clypeus is black:—

Antennæ reaching far beyond thorax	1.
Antennæ not reaching beyond thorax	3.
1. Mesothorax with much black hair. (Calif.)	<i>personatella</i> , Ckll.
Mesothorax without black hair	2.
2. Larger, length about 10 mm. (New Mexico)	<i>tristis</i> , Ckll.
Smaller, length about $8\frac{1}{2}$ mm.; differing also as described	
above	<i>malvina</i> , Ckll.
3. Antennæ scarcely reaching to scutellum; abdomen with-	
out bands. (Texas)	<i>intorta</i> , Cr.
Antennæ reaching to metathorax; abdomen banded	4.
4. Antennæ black, mandibles without a yellow spot. (Oaxaca,	
Mexico)	<i>assimilis</i> , Sm.
Flagellum bright ferruginous beneath, mandibles with a	
large yellow spot. (Sta. Fé, New Mexico)	<i>sphæralcea</i> , Ckll.

Agapostemon texanus, Cresson.—♀. Bluer than usual. Cerro Chilicote, April 3rd, on flowers of some species of Compositæ (Townsend). Although this species is now first recorded from Mexico, its occurrence in the State of Chihuahua could have been predicted with certainty, as it is very common in the adjacent parts of the United States.

COCCIDÆ.

Tachardia cornuta, Ckll.—Cerro Chilicote, at mouth of cañon on south side, March 22nd, on a bushy composite plant called *Salvilla* by the Mexicans (Townsend). The specimens are more irregular than the original types. This makes the sixth lac-insect from Mexico.

Lecaniodiaspis rufescens (Ckll.).—Cerro del Chile, east base in Arroyos, on green spiny shrub, March 26th, 1902 (Townsend).

Eulecanium robinia (Townsend).—Cerro Chilicote, April 10th, on ash (?) and *Rhus* (?). Collected by Townsend. This is a shiny dark ferruginous convex scale; rugose, more or less pitted, and covered with a waxy secretion at the sides. Length 6, breadth 4, height $3\frac{1}{2}$ to 4 mm. I have been doubtful whether to regard it as veritable *robinia*, and conclude for the present to designate it as a new variety—*subsimile*—agreeing with *robinia* in the general form and appearance of the scale, the character of the skin and the dimensions of the legs, but differing in having the antennæ 8-jointed (7-jointed in *robinia*) and the eggs white (pink in *robinia*). The antennæ and legs of *subsimile* measure as follows in μ :—

Antennal joints: (1) 30–36, (2) 30–36, (3) 45–48, (4) 44–48, (5) 18–20, (6) 20–21, (7) 18, (8) 28–30.

Legs: femur and trochanter, 135–138; tibia, 96–102; tarsus, 66–75.

The scale is narrower and more shiny than specimens referred to *E. robinia*, which I lately collected at Tempe, Arizona, on osage-orange. The Tempe insect has the antennæ 7-jointed, measuring as follows:—(1) 33, (2) 30–36, (3) 42, (4) 33–42, (5) 18, (6) 15–16, (7) 30–38.

It seems that *E. robinia* and its varieties (or closely allied species?) are almost certainly natives of the south-west, and are not identical with *E. robiniarum* (Douglas), as has been supposed. The exact classification of these forms is a matter of difficulty; we need more material from different plants and localities, and a knowledge of the early stages and males.

East Las Vegas, New Mexico, U.S.A.
April 17th, 1902.

ON SOME NEW GENERA AND SPECIES OF HYMENOPTERA (ICHNEUMONIDÆ, CHRYSIDIDÆ, FOSSORES, AND APIDÆ).

By P. CAMERON.

ICHNEUMONIDÆ.

(Continued from p. 111.)

HABROJOPPA, gen. nov.

Antennæ dilated and compressed beyond the middle; the apex attenuated. Eyes small, reaching to the middle of the face, the malar space being large; they are parallel on the inner side. Occiput margined. Clypeus not separated from the face by a suture. Labrum hidden. Mandibles with two equal teeth on the apex. Mesonotum reticulated, without furrows. Scutellum stoutly keeled laterally; its apex incised. Median segment reticulated; the basal and central areæ only are defined; the spiracles linear. Areolet much narrowed at the top; the transverse cubital nervures almost meeting there; it is angled below, and receives the recurrent nervure near the middle; the transverse median nervure is received shortly beyond the transverse basal on the outer side. Legs normal; the claws simple. Petiole long and slender, dilated at the apex; the spiracles are placed near the apex of the basal fourth. Gastrocoeli large, deep. There are seven segments; the last three are smaller than the others, and form a sharp point; the ovipositor hidden; the ventral fold only extends to the apex of the second segment; the last ventral segment is large, entire, broadly rounded at the apex; its base extends to the base of the penultimate dorsal, and does not extend to the apex of the last dorsal; there are only six ventral segments in the female. The apex of the hinder femora reaches to the base of the fourth segment.

From *Charitojoppa* it may be known by its more slender form, by the scutellum not being pyramidal, by the petiole being more slender, and not broadly dilated at the apex. In the form of the scutellum it more resembles *Magrettia*,* but it wants the coxal spine, the pronotum is not incised behind, and the second and third segments are longitudinally striated; the petiole is more slender towards the apex, and longer, more as in *Ichneumon* than as in *Platyuri*.

HABROJOPPA RUFO-PETIOLATA, sp. nov.

Cærulea; abdomine albo annulato, basi rufo; pedibus rufis, tarsis posticis nigris; alis fusco-hyalinis. ♀. Long. 12 mm.

Hab. Khasia (coll. Rothney).

Antennæ black, the eighth to the thirteenth joints white, the apical joints compressed, fuscous. Head shining, blue, the face and

* *Magrettia*, I find, is preoccupied in Orthoptera. I now propose the name of *Xenojoppa* for it.

clypeus sparsely punctured; sparsely covered with short fuscous hair; the inner orbits from near the base to opposite the lower ocellus, a mark on the side of the clypeus, the base of the mandibles broadly, and the palpi yellow. The clypeus not separated from the face by a suture, nor foveate. Mesonotum coarsely reticulated; the sides depressed, crenulated; there is a smooth furrow on either side from nearly opposite the base of the tegulæ to the apex. Scutellum smooth, impunctate, its sides keeled; at its base is a large, deep, smooth, slightly curved depression; from shortly behind the middle to near the apex it is pallid yellow. The areola is longer than broad; becomes slightly and gradually wider to beyond the middle, then becomes gradually narrower; its base is rough; in the middle at the apex is a stout longitudinal keel; the posterior median area is stoutly transversely striolated; the spiracular area behind the spiracles is finely rugose, in front of them stoutly transversely striolated. The base of the pronotum has a few curved striæ; above, at the apex, it is irregularly stoutly striolated; the lower side is stoutly obliquely striolated; the upper part of the mesopleuræ and the apex with a few stout irregular keels; the rest closely and coarsely punctured, almost reticulated; the upper part of the metapleuræ at the base coarsely aciculated; the middle at the base with fine stout curved keels; the rest closely and stoutly reticulated. Mesosternum closely punctured; the furrow large, wide and triangular at the apex. Legs ferruginous, the fore coxæ paler at the base; the apex of the hinder tibiæ and the tarsi black; the latter spinose beneath. The areolet is narrowed at the top, but the nervures do not touch; the recurrent nervure is received almost in the middle of the areolet. The petiole is ferruginous, yellow at the apex, carinate down the middle, and striated on the base of the dilated part; the second, third, and fourth segments are blue; the second and third closely punctured, the others smooth; the second acutely striated in the middle between the gastrocœli, which are striated at the base, their apex smooth and brownish; the apical segments are for the greater part yellowish.

Holcojoppa, gen. nov.

Abdominal segments strongly constricted at the base, and clearly separated; the constrictions deep and closely longitudinally striated; the segments longitudinally striated, and broadly depressed laterally; the petiole raised in the middle, and bearing there two longitudinal keels; there are seven segments; the last is small and has stout cerci. Scutellum conical, large, distinctly raised above the level of the mesonotum; its basal slope is steep, its apical long and gradually sloped from the top to the apex. Post-scutellum smooth, bifoveate at the base, and with a deep depression on either side. The median segment is widely and deeply obliquely depressed at the base; the areola is represented by a smooth tubercle; there are three large areæ on the apical slope; the spiracular area being also defined; there are no spines. Wings larger than usual; the apex of the abdomen does not reach to the areolet when folded against it; the areolet is large, five-angled, narrowed above; the two transverse cubital nervures are roundly curved; the transverse median nervure is received beyond the

transverse basal; the wings are yellowish hyaline, with the apices of both infuscated. The hinder legs are much longer than the four anterior; they are longer than the body; the apex of the hinder femora reaches to the apex of the fourth segment; the tarsi are spinose. The head has the vertex depressed between the eyes; it is sharply obliquely narrowed behind them; the face is longish; the malar space is large; the labrum projects. The transverse median nervure is almost interstitial; there is the stump of a nervure on the disco-cubital nervure; the transverse cubital nervure in the hind wing is broken far below the middle; the lower part of the metapleuræ is bounded by a keel, and there is a stouter curved keel below the middle; the gastrocœli are deep, narrow; the ventral keel extends to the end of the third segment; the antennæ in the male are slightly serrate.

A distinct genus, easily known by the constricted segments of the abdomen separated by deep furrows.

HOLCOJOPPA FLAVIPENNIS, sp. nov.

Lutea, flagello antennarum tarsisque posticis nigris; alis flavo-hyalinis, apice nigris, stigmatibus testaceo. ♂. Long. 14–15 mm.

Hab. Khasia (coll. Rothney).

Uniformly rufo-luteous; the inner orbits, the fore legs in front, the three divisions of the pleuræ behind, and the petiole broadly at the base, more or less yellowish. The scape of the antennæ rufous, punctured, thickly covered with short fuscous hair; the base of the flagellum dull rufous, the rest blackish. Head somewhat triangular behind, being narrowed to a rounded point in the middle; the face roundly projecting in the middle, and obscurely punctured; the sides flat, yellowish, impunctate; the clypeus obscurely punctured; the apex obliquely depressed; the mandibles pale yellowish; the teeth black; the palpi rufo-testaceous. Thorax ferruginous above; the sides paler, having a yellowish tinge; thickly covered with short hair, dark on the mesonotum, paler on the pleuræ. The roundly pyramidal scutellum shining, rather thickly covered with longish fuscous hairs, and bearing all over large deep, not very widely separated, punctures; the post-scutellum small, not very distinct; the space on either side of it depressed, wide, smooth, and having a few stout irregular keels. The base of the median segment widely separated from the post-scutellum, raised to nearly the level of the top of the scutellum; without any defined area, but with two stout straight keels going down the centre, which is coarsely irregularly transversely striolated; the sides rugosely irregularly reticulated. Propleuræ closely punctured above, yellowish and impunctate below; the upper half of the mesopleuræ shining, impunctate; the middle with a wide shallow longitudinal depression down the centre; the lower half closely punctured, and of a yellowish hue at the base and apex; the metapleuræ with a wide oblique depression on the base at the top; over the sternum is a wide shallow furrow, bearing stout widely separated, slightly oblique keels. Legs rufo-testaceous; the apex of the hinder tibiæ and the tarsi blackish; the fore legs of a paler, more yellowish hue, and thickly covered with short white hair; the hair on the hinder tibiæ and tarsi blacker.

Wings yellowish hyaline, the apices blackish; the areolet narrowed at the top; the first cubital nervure slightly, the second distinctly, roundly curved, the two almost uniting at the top; the recurrent nervure is received almost in the middle. The basal half of the petiole greatly narrowed, yellowish; the apical with two stout keels down the middle, and coarsely punctured; the other segments coarsely rugosely punctured, striolated at the base down the centre; all the segments separated by a deep moderately wide depression; the ventral surface whitish.

CRYPTINA.

OSPRYNCHOTUS PERONATUS, sp. nov.

Niger, tegulis, apice scutelli, post-scutello, maculis 3 metanoti, ore orbitisque oculorum flavis; pedibus flavis; coxis, trochanteribus, femorum posticorum dimidio apicali apiceque tibiae posticarum nigris. ♀ et ♂. Long. 16, terebra 6 mm.

Hab. Khasia (coll. Rothney).

Antennæ black; the tenth to fifteenth joints white, stout; the scape yellow beneath, and covered with short white hair. Head black; the face, except for a conical mark in the middle under the antennæ, the clypeus, labrum, the inner orbits above, and the outer more broadly below, and the palpi, yellow; the clypeus is edged with black at the sides and apex; the mandibles are entirely black. The face is closely, the clypeus more coarsely and not so closely punctured. Vertex strongly punctured, and with a few oblique striæ below the ocelli; the front depressed, at the sides very smooth and shining. Thorax black; a broad line on either side of the base above, the tegulæ, scutellum, except at the base, the post-scutellum, the scutellar keels, the apex of the median segment at the base and sides, the base more narrowly than the sides, where the yellow is dilated broadly outwardly, and a somewhat oval mark immediately under the hind wings, yellow. Mesonotum closely and strongly punctured, thickly covered with short white hair; its middle lobe is distinctly raised at the base; the scutellum shining and thickly covered with long white hair, and sparsely punctured; the punctures are large, round, and shallow; the post-scutellum is almost impunctate; its base is deeply bifoveate; the depression at the sides is not striated, and is covered with long white hair. The median segment, at the base behind the transverse keel, is closely punctured; the punctation is stronger towards the apex, in the middle of which is a stout short semicircular keel; in front of the keel the segment is coarsely punctured, rugosely so at the apex, which has a slight oblique slope; its sides and top are bordered by a stout keel; the black mark in the middle is rounded at the base, transverse at the apex, and twice longer than broad. Pro- and mesopleuræ closely punctured; the lower part of the former with some stout longitudinal keels at the apex; the metapleuræ more strongly punctured; the punctures run into reticulations, and are stronger on the lower side; over the hinder coxæ is a large yellow mark, twice longer than broad, and rounded and narrowed at the top. Wings hyaline, the apex smoky; the stigma and nervures black; the areolet is a little longer than wide, slightly narrower at the top than at the bottom; the recurrent nervure is received shortly beyond the middle; the second transverse cubital

nervure is bullated on the lower side, but not strongly. Legs fulvous; all the coxæ and trochanters, almost the apical half of the hinder femora, and the apical third of the posterior tibiæ, black; the hinder tarsi have a more yellowish paler hue, and are black at the base. Abdomen black and shining: all the segments are banded with yellow at the apex; the ventral surface, except the petiole, pale yellow.

This is an *Osprynchotus*, Spin., sec. Ashmead, non Kriechbaumer, which equals *Linoceras*, Tasch. The genus is new for the Indian fauna.

(To be continued.)

NOTES ON NEUROPTERA OF OXON AND BERKS.

By W. J. LUCAS, B.A., F.E.S.

RECENTLY I received for inspection from Messrs. W. Holland and A. H. Hamm a box of Neuroptera (other than Odonata) collected in Berks and Oxon. Insects of this order are so seldom recorded that the list will probably prove of interest to those who are working at them. I have to thank Mr. C. A. Briggs for assisting very greatly in naming the specimens, especially the more obscure ones.

OXON.

EPHEMERIDIA.—*Ephemera vulgata*, Thames side near Binsey, and canal side north of Oxford. *Cloëon rufulum*, Oxford. *Centroptilum luteolum*, Godstow and Oxford.

PLANIPENNIA.—*Sialis lutaria*, canal side north of Oxford, and Thames side at Binsey. *Raphidia xanthostigma*, Shotover Hill (May 28th). *Sisyra fuscata*, Thames side at Binsey (May 29th). *Chrysopa flava*, University Park, Oxford. *C. vulgaris*, taken in the Museum, Oxford (Mar. 28th). *C. perla*, near Oxford. *Panorpa germanica*, Stow Wood.

TRICHOPTERA.—*Phryganea striata*, Charlbury, Wychwood Forest. *Limnophilus lunatus*, Oxford. *Anabolia nervosa*, Oxford. *Notodobia ciliaris*, canal side north of Oxford (May 26th); not a common species. *Leptocerus cinereus*, Thames side at Binsey. *Mystacides nigra* (McLach., Trich. Eur.), canal side north of Oxford. *M. azurea* (McLach., Trich. Eur.), Thames side at Binsey.

BERKS.

EPHEMERIDIA.—*Ephemera vulgata*, Thames side above Godstow, and Reading. *E. danica*, Reading. *Leptophlebia marginata*, Thames side above Godstow (June 1st), and Wellington College, near Reading (April 22nd.) *Centroptilum pennulatum*, Thames side near Oxford (May 27th). *Ecdyurus volitans*, Thames side above Godstow (June 1st, 1901); an interesting capture.

PLANIPENNIA.—*Sialis lutaria*, Thames side above Godstow. *Raphidia notata*, Wokingham, near Reading. *Sisyra fuscata*, Thames side above Godstow (June 1st). *Hemerobius stigma*, Wellington College. *Chrysopa vulgaris*, Wellington College. *C. septempunctata*, Ferry Hineksey. *C. ventralis*, Tubney Wood, and Wokingham. *C. perla*, Thames side near Kennington. *Panorpa communis*, Tubney Wood, and East Ilsley. *P. germanica*, Tubney Wood, Thames side above Godstow, and Boar's Hill, near Oxford.

TRICHOPTERA.—*Phrygania striata*, Reading. *Colpotaulius incisus*, Thames side above Godstow. *Grammotaulius atomarius*, Reading. *Limnophilus rhombicus*, Reading. *Notidobia ciliaris*, Thames side above Godstow (June 1st). *Goëra pilosa*, Thames side above Godstow. *Leptocerus annulicornis*, Thames side above Godstow (June 1st). *Mystacides nigra*, Thames side above Godstow, and the Kennet, Reading. *Neuroclipsis bimaculata*, Reading. *Tinodes weneri*, Thames side above Godstow. *Lype phæopa*, the Kennet, Reading. *Glossoma boltoni*, Thames side above Godstow.

CONTRIBUTION TO THE LIFE-HISTORY OF *LIPHYRA BRASSOLIS*, WESTW.

By F. P. DODD.

(Concluded from p. 156.)

The perfect insect comes forth in twenty-one to twenty-five days, and further astonishing developments in the life-history of this strange insect occur. Before bursting the outer shell the butterfly can be heard moving within, and shortly a sharp cracking sound announces that the burst has been effected, then either a portion of the shell, which opens in the centre in front up to the first furrow, is broken right out, or it opens sufficiently above after breaking away at the rim to admit of the imago's emergence. But who would recognize *L. brassolis* now as he crawls out? Instead of the weak drooping wings of a butterfly, he has little short appendages like a freshly-emerged moth, and lying very flat; the front wing is creamy white to extreme tip, and the edge of the hind wing projects from under this ever so little; the abdomen looks very large, a thick mass of furry-looking substance showing on each side of it to the tip; on the thorax small tufts of loose brownish scales may be noted, which easily roll off. It is soon seen that the white appearance of fore wing is caused by a dense covering of fugitive scales; there is also a small patch on each side of thorax. As the wings slowly lengthen, the density of the scales lessens sufficiently to admit of a view of the black and rich yellow colouring underneath.

These white scales fly off after expansion of wings at the least breath of air; they are blown away much more easily than the scales on our clearwinged hawks (*Hemaris kingii*, *hylas*, and *janus*). A stroke or two of the insect's wings detaches everyone in a cloud; therefore it is a difficult matter to kill and set specimens and leave a fair proportion of these scales. The matter on the abdomen is of course also composed of scales; they are dark grey, packed very densely, and cover about half of ventral surface, reach further along the sides, but do not reach the thorax, none being on the upper surface. These are much more adhesive, and must be scraped away, as they cannot be blown off; they come away in masses, and fasten lightly to anything they come in contact with, and appear to be held together. Upon examining them with a lens, exceedingly delicate threads can be discerned dispersed throughout. The legs and antennæ are also clothed with minute and easily detachable white scales.

The insect requires longer than the largest Australian moths to pump its wings to their full length. The wings of even the gigantic *Zeuzeridæ* attain their full proportions in fifteen or twenty minutes, and I have seen a five-inch hepialid expand the wings in seven minutes; but our butterfly requires twenty-five to thirty minutes, and instead of being prepared for flight in a little over an hour, like the *Antheræa* and many other large moths, is quite helpless for a much longer period, and none of my specimens exhibited the least desire to fly in three or even four hours. The great *Ornithoptera cassandra* flies in a comparatively short time.

The butterflies are very oily; in some instances grease came through abdomen in less than a week after setting. A thick layer of almost liquid grease lines the abdomen, so it was necessary to resort to stuffing the insects; unfortunately this operation causes displacement of the extra scales to some extent, especially in the male.

As to the butterfly being crepuscular in its habits, I may mention that I am frequently out in the twilight, but have not met with it; that may be on account of its rarity. However, they are decidedly wideawake in the daytime. I have captured several which I had disturbed as any ordinary butterfly would be disturbed. Several times they have flown from near ant-nests which I was about to examine; one specimen was seen flying across an open space in the early afternoon, and had evidently come from a fair distance, as there were no green ants in the vicinity. Many years ago I caught my first specimen, a female, on a hot summer day about eleven o'clock. It flew rapidly across a scrub and settled on a branch under the foliage, precisely as the egg-depositing female did which I observed in July, 1900.

Now, concerning the loose scales on this unique butterfly, we have no evidence that the larvæ are welcome inhabitants of the ants' nests. However, it is highly probable that the ants have no friendly feeling for the perfect insect, and would most likely attack and kill it during its long rest after emergence if it were not specially and wonderfully protected. So it will be seen that the loose scales act as a perfect protection, for directly the ants encounter these they are in trouble; they fasten on to their feet and impede their movements, or, if their antennæ or mandibles come in contact with any part of the butterfly, the scales adhere thereto, so that the ant is soon in a bad way, and has quite enough to do in attempting to free himself of his encumbrances without taking any further interest in the butterfly, from which he retreats as well as possible. It is exceedingly ludicrous to observe the ants endeavouring to free themselves; their legs move awkwardly, and their mandibles are opened and closed in evident annoyance and perplexity, and they are much concerned at the state of their antennæ, for the obnoxious scales will not be shaken off, and they seem to become very low-spirited.

It is amusing to observe this dejected change in an ant after his first spar with *L. brassolis*, for he is such a pert pugnacious fellow, and perfectly willing to tackle anything that moves if in proximity to his pets or nest. As mentioned, I had several small nests of ants taken home, and could introduce them to the butterfly as I wished. It would doubtless be highly entertaining to watch a numerous colony of ants making the acquaintance of a freshly-emerged butterfly.

The small wings of the insect enable it to get through the nest entrances. The scales on fore wing are necessary to his safety whilst he is crawling out, for the ants might in some cases evade his legs and get on to the thorax; but if the scales there did not vanquish him, those on the fore wing would. As the butterfly's abdomen becomes strong enough, he raises the tip to touch the support where he is hanging; in that position he is invulnerable, hundreds of ants could not hurt him. As the fore wings lengthen and touch there is no further need of the scales thereon. The wind doubtless dislodges the majority before the insect flies off, but the other scales would not disappear wholly for some time.

I placed four larvæ on a nest where I knew there were none, and afterwards visited it, and obtained two pupæ therefrom. Upon another small tree with several ant habitations, seven larvæ were placed, and going there some days later I found one chrysalis on the outside of a nest, one within, several attenuated larvæ wandering about the tree—the ants, having become familiar with their presence, taking no notice of them—and a dead larva on the ground. It would appear that the entrances to the nests were too small for the larger caterpillars to gain

admittance. Once I saw a larva on the outside of a new nest, and I took a pupa on another; these were in localities where I had not interfered with the ants. These instances serve to show that the larvæ pass from one domicile to another, presumably when their pabulum is exhausted in one. They are very slow moving, and when they find it necessary to change quarters, they must wander after sundown, for out of over eighty larvæ and pupæ which passed through my hands not a single example was parasitised; but the other *Lycanids* I have mentioned, though seemingly always accompanied by a number of ants, in both larval and pupal stages, are frequently victimised by *Diptera* and *ichneumons*; but these species do not live in the ant nests, and being day feeders (I don't know about night), numbers are stung.

The larvæ of *L. brassolis* are evidently so tough-skinned that the mandibles of the ants can make little or no impression upon them, for in placing specimens upon a nest, the inmates rush out at them, catch hold of the caterpillar rim, and appear to be acting most viciously. They also endeavour to reach the head or legs, but these are at once protected, the creature just lowers its great sides and is secure. After examining caterpillars which have been on nests for several hours, and tugged at and nipped by dozens of ants, not a mark or wound was discernible; yet, if the slightest cut is made in the rim with a knife, juices issue as from any ordinary caterpillar with an opening in the skin.

In conclusion, I may mention that it is not all pleasure searching for *L. brassolis*, or other insects, in the habitations of the green ants. This species is as plucky and determined as the fierce and dreaded "bulldog" and "jumper" ants, and come trooping in hundreds from all parts of the tree when a nest is disturbed. Then there is the multitude in the nest itself, also those in other nests, for often there are many in even a small tree. They are remarkably quick to get upon and spread themselves over an intruder, and do not waste their energies in biting one's clothing; but directly they reach the flesh they commence operations, and one's neck and arms suffer considerably. The bite of the insect is trifling, but he discharges a liquid on to the bitten spot, which gives sharp pain. In approaching closely to an ants' nest, or where they are in attendance upon scales, aphides, or other insects, they show fight unmistakably. Whilst they are prancing and plainly showing that they are desirous of a closer acquaintanceship, it will be noticed that the abdomens are held up and occasionally jerked forward; this jerking action means that the insect has brought his little "squirt" into play, a jet of decidedly acrid liquid being discharged therefrom, sent straight over his head, and capable of striking an object several inches direct in front before it assumes a downward tendency. Having received several of these jets, or part of them, in the

eyes, on the lips, and often had the liquid in cuts or scratches, I can testify as to its stinging properties. When hundreds of ants are sending forth these jets, which can be seen against the sun, it behoves one to be careful when in their immediate vicinity. We have many interesting species in Queensland, but this green tree insect, with his vast colonies, strangely used larvæ, and queer and varied acquaintances, is the most remarkable of all.

Warburton Street, Townsville, Queensland.

A LIST OF TORTRICES TAKEN IN SOUTH ESSEX BETWEEN 1885 AND 1901.

By A. THURNALL.

(Continued from p. 169.)

Grapholitha cinerana, Haw.—Considered by many to be a var. of *nisella*. I have not met with it, but, if I am not mistaken, Mr. Harwood told me once that he takes it near Colchester.

G. nigromaculana.—Somewhat local, but usually common (sometimes very common) where it occurs, amongst *Senecio jacobæa*, on the seeds of which plant the larva feeds in September. I once bred a specimen, which did not emerge till the second season after spinning up. Near Harold Wood, Witham, Upminster, &c.

G. campoliliana, Tr.—Generally distributed amongst willow, from which it may be beaten in June.

G. minutana, Hb.—Local and uncommon amongst poplar. Near Lea Bridge, Wanstead, and Ongar are the only places where I have taken it.

G. trimaculana, Don.—Exceedingly abundant and variable, may be beaten from elm in hundreds; the larva equally common earlier in the season.

G. penkleri, Fisch.—Common in many places amongst nut bushes and alder, on both of which the larva feeds.

G. obtusana, Haw.—Locally common. I have beaten it from oak, wild rose, and blackthorn. Perhaps most abundant at Fairmead Bottom, Chingford. Larva quite unknown to me.

G. nævana, Hb.—Very common amongst holly, in the shoots of which the larva may be found abundantly in June.

Phlacodes tetraquetra, Haw.—Equally common in May and early June amongst birch shrubs.

P. immundana, Fisch.—Not very scarce (and widely distributed) where alder grows commonly, in May; a second and less common brood in August.

P. demarniana, Fisch.—Rather scarce and local amongst birch. I have taken it at Loughton, Warley, and near Ingatesstone.

Hypermeia angustana, Hb.—Not uncommon amongst its food-plant, willow, in most places where its food-plant is abundant.

Batodes angustiorana, Haw.—Very common, especially upon yew,

which seems to be the favourite food of the larva, which, however, feeds upon a variety of other trees and plants.

Pædisca bilunana, Haw.—Very common at rest on birch trunks, but not always easily seen on account of its whitish colour matching so closely the bark of the tree.

P. oppressana, Tr.—Very local on *Populus nigra* trunks. I have only met with it, as far as Essex is concerned, near Loughton.

P. corticana, Hb.—Very abundant almost everywhere amongst oaks; varying from greenish to almost coal-black.

P. profundana, Fb.—Much less common; may be occasionally beaten from oak, whitethorn, &c., at Loughton, but I have not taken it elsewhere.

P. ophthalmicana, Hb.—Local, but fairly common where aspen shrubs grow freely. May be beaten from them towards the end of September. Ongar Park Woods, near Ingatestone, and near St. Osyth.

P. occultana, Dougl.—Probably found in most plantations where larch grows freely, but I have only met with it near Brentwood, where the larva is in some seasons not at all rare.

P. solandriana, L.—Distributed throughout wherever birch shrubs are found; some of the numerous vars. are very pretty.

P. semifuscana, St.—Usually considered a common insect, but I have only met with a few larvæ on sallow near Thames Haven; it must surely be found in many other places in the county.

P. sordidana, Hb.—Common where it occurs, more especially in the larva state, on alders. Warley, Wanstead, Harold Wood, Witham, &c.

Ephippiphora bimaculana, Don.—Local, and never very common amongst birch shrubs. Near Brentwood, Wanstead Park, and rarely at Loughton.

E. pflugiana, Haw.—Generally common, especially in the larva state, in thistle stems. Varies much in size, some of my specimens being no larger than the next species, *circiana*, Zell., which I have not taken in S. Essex.

E. inopiana, Haw.—Very local. I have only found it in two or three places. On the roadside between Stamford Rivers and Epping, and more commonly in a boggy place near East Horndon, always amongst *Inula dysenterica*, in the roots of which the larva passes the winter.

E. brunnichiana, Fröl.—Distributed throughout amongst *Tussilago farfara*, in the roots of which the larva may be found in the autumn and early winter. I have bred specimens of a creamy white colour, with scarcely any markings on the upper wings.

E. feneana, Haw.—May generally be found in the larva state in the winter in the old gnarled roots of *Artemisia vulgaris*; the imago not so often seen. Laindon, Lea Bridge, Fobbing, and Pitsea.

E. signatana, Dougl.—Mr. Machin used to beat this insect rarely from blackthorn (its food-plant) and oak at Chingford, but I have searched for it there many times in vain.

E. trigeminana, St.—Usually to be found in waste places and on railway banks wherever its food-plant, *Senecio jacobæa*, grows. The larva feeds on the roots, and may be dug up freely in the late autumn. When bred, the female especially is a very pretty insect.

E. tetragonana, St.—Local, and rather scarce. My own series

were obtained by beating the wild rose bushes at Loughton at the beginning of August. Varies much in dimensions. I have a specimen from Hunstanton scarcely larger than the little *C. argyrana*.

E. populana, Fb.—Somewhat local amongst its food-plant, willow, and, I think, willow as well. I once bred a number from larvæ feeding on dwarf willow in Wicken Fen.

E. gallicolana, Zell.—May be sometimes beaten from oak, or found at rest on the trunk, but by far the best way to obtain it is to gather the old oak-apples in the winter; the imago comes out, but not always freely, in May. One season I bred over fifty, and another winter's work resulted in a single specimen.

E. obscurana, St.—Has been taken rarely in Epping Forest, but I have never had the good fortune to meet with it in Essex or elsewhere.

Olindia ulmana, Hb.—A single worn female specimen beaten from a hedge in early June last at Benfleet or Hadleigh is the only one I have met with.

Semasia spiniana, Dup.—Decidedly rare. I have taken it flying in the afternoon late in August at Fairmead Bottom, Chingford, and a few worn ones (generally singly) in three or four distant localities. Although there can be little doubt that whitethorn is the food-plant of the larva, it has never been bred to my knowledge.

S. ianthinana, Dup.—Much more common than the last, flying over whitethorn, in the berries of which the little pink larva may be found in September and October, along with the greyish larva of *Larerna atra*. It leaves when full-fed, and spins up in bark; when bred it has a rich purple gloss on the fore wings, which soon fades away.

S. rufillana, Zell.—Common, and generally distributed wherever *Daucus carota*, its food-plant, grows. Larvæ in abundance in the umbels, often eight or ten in a single one.

S. wæberiana, Schiff.—Not rare at rest on apple and cherry trunks, in the bark of which it feeds in the larval state. Most of my own series were taken on the trunks of wild cherry growing in Wanstead Park.

Coccys strobilana, Hb.—Local, and more often found in the larval stage in the cones of spruce fir, pupating therein in April, when by gathering a lot of the fallen cones a series may be bred. I have only met with it near Warley and near Blackmore.

C. splendidulana, Gn.—Fairly common at rest on oak trunks, and may be often bred from oak-apples gathered during the winter.

C. argyrana.—Generally common in May and June at rest on oak trunks; not very variable, the only notable specimen is one of a dirty white, without any prominent markings, taken in Bushwood, Wanstead (May 7th, 1892). May often be bred freely from oak-apples gathered in the winter months.

C. nigricana, H. S.—Rare and very local. I took it for the first time in Essex, I believe, on Jubilee-day, 1887, by beating the boughs of a fir tree near Brentwood, taking about twenty on that occasion. I took it again (two only) in 1892; have not worked for it since.

C. hyrciniana, D. L.—Very common and variable amongst spruce fir everywhere.

Hemimene fimbriana, Haw.—Not common, but widely distributed amongst oaks in April. I have bred a very few from oak-apple-

gathered in the winter, and netted it very rarely flying in the sunshine over oak bushes.

Retinia buoliana, Schiff.—Very common wherever *Pinus sylvestris* grows, the larvæ often doing considerable damage to the young shoots.

R. pinicolana, Doubl.—Much rarer than the last species; singly in Wanstead Park, Warley, and Blackmore at rest on *P. sylvestris*.

R. pinivorana, Zell.—Pretty common amongst *Pinus* throughout; variable. Some of the vars. are very pretty.

Carpocapsa splendana, Hb.—Much more abundant in the larval than the perfect state; the acorns in September and October are sometimes much infested with them; I bred a large number last year from acorns picked up at Loughton the previous autumn.

C. grossana, Haw.—Locally common in the larval state in beech-nuts, often two seasons before coming out, like the previous species. The imago may sometimes be beaten from beech boughs, or found at rest on the trunks. Epping Forest, Brentwood, &c.

C. pomonella, Lin.—Found, I believe, wherever apple trees grow; also feeds in the apples of the wild crab. The spun-up larva may be found in the winter and spring under loose pieces of bark or moss on the trunks.

C. juliana, Curt.—Somewhat local, but common in certain localities. May be found early in June at rest on oak trunks. I have met with it in several localities, but nowhere so commonly as around Wanstead.

C. nimbana, H. S.—This very local and very distinct species seems to be much wanted by collectors. I have bred a good number, perhaps fifty, in the past few years from spun-up larvæ found under rough bark on beech trunks in Epping Forest in the winter. Very occasionally found at rest thereon early in May. I have never met with the feeding larva.

Opadia funebrana, Tr.—Larvæ sometimes found in bought damsons. The late Mr. Machin used to beat the imago rarely from blackthorn at Chingford, and he bred a series from larvæ feeding in the fruit. I have not met with the imago in Essex.

Endopisa nigricana, St.—Very common in pea-fields, or on railway banks amongst vetches; varies a good deal in size and depth of colour. For this reason, I suppose, some authors have made two species from this insect.

Stigmonota leguminana, Zell.—Always very rare and local. Although constantly on the look-out for it every June, I can only boast of three rather indifferent specimens in sixteen seasons! Strictly confined to the Loughton part of Epping Forest, from the village to the borders of Monkwood. Larva unknown to me.

S. perlepidana, Haw.—Not particularly abundant; may be sometimes found flying high up in the sunshine in May. I have bred it from larvæ taken at Loughton feeding on *Lathyrus macrorrhizus*.

S. internana, Gn.—Local amongst furze in open spaces in Epping Forest and near Chelmsford, but nowhere so abundantly as on Warley Common at the end of May and early in June.

S. compositella, Fb.—May be found almost always in clover-fields by sweeping in May and August. Near Childerditch, Ongar, Canvey Island, &c.

S. weirana, Dougl.—Very common in Epping Forest, at Brentwood,

&c., amongst beech. The larva may be found in September and October between two leaves spun together, pupating therein; very easy to breed.

S. redimitana, Gn.—As common as the previous species, and more generally distributed amongst oaks. The habits of both larva and imago are also precisely the same as *veirana*.

S. regiana, Zell.—Occurs almost everywhere where sycamores grow; the larva spun up under the bark through the winter and spring; the imago not so often met with. The nearly allied and equally beautiful *trauniana*, Schiff., I have never met with.

S. roseticolana, Zell.—Common in the larval state everywhere, in the “hips” of the wild roses. Not difficult to rear if pieces of rough bark are put in the pot for the larvæ to spin up in.

S. germarana, Hb.—May be beaten from or netted flying round oak boughs in May and early June. Epping Forest, Warley, Hadleigh, &c. I have spent many, many hours vainly searching for the larva; one was once bred casually by the Rev. G. Raynor from some oak twigs gathered to feed other larvæ on.

Dichrorampha politana, Hb. — Local, but has been met with very sparingly in several distant localities amongst its food-plant, *Achillea millefolium*. Near Upminster, Pitsea, Harold Wood, and Purfleet.

D. alpinana, Tr.—I have only met with it in a small clump of *Tanacetum vulgare* growing in a garden at Stratford; the larva in the roots through the winter, and the imago late in July at rest during the daytime amongst the foliage.

D. alpestrana, H. S.—This species, which I had the pleasure of adding to the British list in 1893, seems to be very local; indeed, I have only met with it in the original spot where it first turned up in Epping Forest, and in a similar locality about half a mile away. It has since been taken in Sussex, and doubtless in other places. For remarks concerning habits, food-plant, *vide* E. M. M. vol. xxix. p. 175.

D. petiverella, L.—Very common almost everywhere amongst *Achillea millefolium*.

D. sequana Hb.—Somewhat local, but generally common where found. I have bred it from *A. millefolium*. Loughton, Ingatestone, Childerditch, and many other places.

D. plumbagana, Tr.—Very common and generally distributed; seems very partial to railway banks.

D. acuminatana, Zell.—Local and uncommon. I have only met with it very sparingly amongst *Chrysanthemum leucanthemum* on the railway bank near Harold Wood in September, and the first brood early in June at Mill Green, near Ingatestone.

D. simpliciana, Haw.—Not uncommon amongst *Artemisia vulgaris*, in the roots of which the larva feeds, through the winter. The imago is sluggish, and when beaten out immediately makes for the shelter of its food-plant again.

D. consortana, St.—Local and uncommon. I have very occasionally taken the larva and imago on railway banks. Harold Wood, Woodford, and near Thames Haven. The larval habits are different from the other species of this genus, feeding in the growing shoots of *Chrysanthemum leucanthemum*, and pupating therein.

Lipoptycha plumbana, Scop.—Frequents the same places with *plumbagana*, and the two species are generally to be found together. The allied *L. saturnana* I have never met with.

Pyrodes rheediella, L.—May be taken freely at the end of May flying in the sunshine round the tops of tall hawthorn bushes or hedges. Generally distributed. The larva feeds in the green berries.

Catoptria albersana.—Not common anywhere, but widely distributed. I have taken a fair number at Warley, also, but rarely at Wanstead, Epping, Ingatestone, and Hadleigh. The larva may be found in September in rolled-up leaves of honeysuckle, and is not difficult to breed.

C. ulicetana, Haw.—In swarms round almost every furze bush. I once or twice met with specimens almost as strongly marked as the well-known Scotch form *assectana*, St., but as a rule they are very plainly marked in Essex.

C. hypericana, Hb.—Somewhat local amongst *Hypericum*, in the young shoots of which the larva may be found early in May. Localities are Ingatestone, Blackmore, South Weald, Chelmsford, &c.

(To be continued.)

NOTES AND OBSERVATIONS.

THE BRITISH MUSEUM COLLECTION OF BRITISH LEPIDOPTERA.—In connection with the rearrangement of this collection some living larvæ have been received from Mr. A. M. Smallpeice, Ringwood, Hants, which have been blown and preserved. We have also received promises of larvæ from Mr. Ed. H. Thornhill, Boxworth, Cambridge; and of a large collection of preserved pupæ from the Rev. J. Green, Rostrevor, Clifton. These will all be extremely useful, and we are much obliged to the donors.—G. F. HAMPSON.

NOTODONTA DRYINOPA, Lower.—I stated (*ante*, p. 42) that the pupa of this moth is furnished with a sharp spike on the head, and that the only explanation accounting for the removal of the round piece of the hard cocoon must be that the pupa cuts it out, for no piercing instrument could be found upon the moth. I have now ascertained that the moth, with this spike, cuts the fragment out! The particulars are these: obtaining some of this season's cocoons, containing pupæ, I cut holes in them, determined to watch for developments, and was soon rewarded by observing that the first moth had burst its pupal shell, and was moving, very deliberately, backwards and forwards, in fact, pushing against the wall in front. Upon removing more of the cocoon, to admit of a better view of the operation, I was pleased and surprised to see that the portion of the pupal shell covering the eyes and that above holding the spike, remained fixed to the moth's head; it is kept in position by two little pegs which pass in between the eyes. I have since tried to bottle several of the moths with the head-piece attached, but they strike it off directly they emerge. However, I have sent the pupal head-pieces, cocoons, chrysalids, &c., to a well-known

entomologist, who may have something to say upon this interesting species.—F. P. DODD; Warburton Street, Townsville, Queensland.

HAWK MOTH PUPATING ON BRANCHES OF TREES.—It appears that my note upon *Panacra lignaria* (*ante*, p. 73) is not sufficiently clear, for a leading entomologist in England has taken it to mean that the larvæ had bored into the wood of the trees to pupate! Naturally, he doubted such a strange statement. I trust no others have read the note as he did. Of course the larvæ were spun up in the *leaves* and *twigs*.—F. P. DODD; Warburton Street, Townsville, Queensland.

TORTRICES IN SOUTH ESSEX.—When reading the very interesting article by Mr. Thurnall on "Tortrices in South Essex between 1855 and 1901," I was reminded when I reached the note on *Phaeopteryx myrtillana* that I had recently seen, lying on one of the many new roads in this district, a quantity of bilberry which had been used in the packing of a load of drain-pipes. Such consignments, packed in the same way, are probably commonly seen at Stratford, and might readily account for the importation of *P. myrtillana*, I might add that *Orthotenia ericetana* does occur in South Essex. I have taken it both at Benfleet and Shoeburyness.—F. G. WHITTLE; 3. Marine Avenue, Southend, June 13th, 1902.

FOOD-PLANTS OF THE LARVA OF CNEPHASIA SINUANA, Stph.—In his very interesting "List of Tortrices taken in South Essex, Mr. A. Thurnall says (*ante*, p. 168) that he expects wild hyacinth (*Scilla nutans*) is the only food-plant of the larva of *Cnephasia* ("*Sciaphila*") *sinuana*, and no other food-plant is mentioned in Mr. Meyrick's 'Hand-book of British Lepidoptera,' p. 539 (1895). The idea that the larva confines its attentions to *Scilla nutans* is, however, at variance with the fact, recorded by myself in Ent. Mo. Mag., ser. 2, x. 105 (1899), that Mr. G. Elisha has occasionally bred a few specimens of *C. sinuana* (together with many of *C. pasivana*), from spun-up flowers of *Chrysanthemum leucanthemum*, collected in a wood in North Kent.—EUSTACE R. BANKES; Norden, Corfe Castle, June 7th, 1902.

THE COCCID LECANOPSIS DUGÉSI.—This species was very briefly described by Signoret and Lichtenstein in 1886, and has never since been definitely recognized. In Biol. Cent. Amer., Coccidæ, p. 15, I surmised, that it might be the *Ceoplastodes niveus* (Ckll., 1893). I have now received examples of it from Guanajuato, Mexico, collected there by Dr. Alfred Dugés, who tells me that he did indeed send it to Lichtenstein many years ago, but received no reply concerning it. This, I think, may be considered to settle the matter, and the species will be known as *Ceroplastodes dugési*.—T. D. A. COCKERELL; E. Las Vegas, N.M., May 31st, 1902.

COLOUR CHANGES IN LARVAL HAIRS OF ARCTIA VILICA.—The influence of certain foods in causing alterations in the coloration of some animals is well known to everyone. As a further instance of this influence in the case of one of the Lepidoptera may be of interest to entomologists, I venture to record the following facts:—I have found that if the larvæ of *Arctia vilica*, which usually live on various low-growing herbs, are fed entirely on sallow from the time they are hatched, the hairs covering their bodies are of a black instead of the

usual brown colour. The larvæ are therefore perfectly black with the exception of the red head and legs. The imagines resulting from larvæ modified in this way present no variation from the usual type. I have observed that when the larvæ are partly grown, if the character of their food is changed, and dock and other herbs are substituted for sallow, they, after the next change of skin, are clothed with hairs more or less approaching the usual brown colour.—ALBERT MAY; Hayling Island, May 16th, 1902.

NOTE ON *CALOCAMPA EXOLETA*.—On March 12th and 18th I captured at sugar three of these insects (one male and two females). They were placed under a glass cylinder with various food-plants, and a sprig of sallow with catkins; the latter were occasionally moistened with syrup on which the moths feasted every evening. Nothing particular was observed until April 13th, when I noticed two batches of ova had been deposited on nettle; these proved to be infertile. On April 15th and 20th pairing took place, and the male was then released. By May 3rd over three thousand ova had been laid, and on May 13th the two females, being still alive, were set at liberty.—EDWARD GOODWIN; Canon Court, Wateringbury, Kent, June 16th, 1902.

PROTRACTED EMERGENCE OF *TEPHROSIA BIUNDULARIA*.—I have been rearing the above from eggs from a female taken at Boscombe last April. The imagoes commenced to emerge on Feb. 8th, and have been coming out regularly up to to-day (June 16th). The imagoes show very little variation.—J. A. FINZI; 53, Hamilton Terrace, N.W.

CAPTURES AND FIELD REPORTS.

COLLECTING NEAR TANGIER IN AUGUST AND SEPTEMBER, 1901. — Autumn is the end of the dry season, and so everything is parched up, including the flowers, and there is not a very large variety of insects on the wing, but we caught *Lycæna telicanus*, *L. bœtica*, *Chrysophanus phlæus*, *Papilio podalirius*, *P. machaon*, during the first few days of August, and *Catocala elocata* came in to light on the 11th; they were beautifully fresh in condition. During the first week we saw *Charaxes jasius*, but did not catch one until the 16th. They were numerous and in splendid condition. They sit head downwards, chiefly on branches of the cypress, and are very fond of basking with their wings open; often they fly right away over a large area, and come back again to the very branch they left. We saw ova of this species on arbutus, and when the larvæ hatched they were green with black horns at each end, the pair by the head having a fork. On the 14th a fine specimen of *Charocampa celerio* flew into the hall about 6.30 p.m., and on the 20th we caught a worn *Catocala conversa* during bright sunlight. The next day we took a perfect male *H. zelleri*, and a perfect *Deiopeia pulchella*. I obtained *C. celerio* again in the hall on August 25th; the following day freshly emerged specimens of *P. machaon* were out in great numbers, and we caught several beauties. There were also many more *P. podalirius* than earlier in the month. We found several larvæ of the latter feeding on plum and cherry; they

feed up at a great pace. When first hatched the larva is black, and the skin very rough; after the first change it is black, then green with orange spots, and turns yellow before it pupates. We caught twelve *Hesperia nostrodamus* in one small patch of rough grass on the 27th. They were mostly very good specimens, and seemed very fond of sitting on the lumps of earth. *C. edusa* was about in fair numbers. By watching the plumbago bushes in the evenings I caught ten *C. celerio*: one evening I caught three specimens, and on another two. They are very regular in their appearance, always coming from 6.15 to 6.45. A friend used to watch them hovering round some begonia plants he had in pots in his verandah, and by this means got some ova, which are green at first and laid singly on the upper or lower side of the leaves. The larva hatches out in about nine days, and is light green with a long pink horn. When about a week old it has two purple eye-like marks on the enlarged segments behind the head. There are brown and green varieties of larvæ, as in *C. elenor*. On Sept. 3rd we went to a field in an open plain, where my father had seen two or three *Deiopeia pulchella* a day or two before, when he was riding. We caught twenty-five without any trouble, and as many the next day, and were able to bring back some live females which laid a lot of ova. These hatched in about five days, and fed on a plant which abounded in the field where we caught them; it was a low-growing plant with woolly leaves. The larvæ fed-up well, and were brown with reddish spots and some black hairs when I last saw them. The last species I caught before leaving was *Argynnis pandora*, a very worn female, which we induced to lay by giving her some violet-roots in water in a breeding-cage. This is the only one I have seen here, and the date (Sept. 16th) seems very late. The next day a good *Euprepia pulica* was brought to us. Some of the moths I got at light and while butterflying are:—*Grammodes bifasciata* and *G. alpyra*, *Leucanitis stolidia*, *Cotocala electa*, *Hemerophila abruptaria*, *Acontia luctuosa*, *Noctua nigrum*, larvæ of *Acronycta psi*. I noticed a rather interesting example of memory and protective colouring, for in a long hedge of geranium there was one white leaf, and on this a white butterfly or two used to roost regularly for over a week. We did not see much of *Sphinx convolvuli*, but we were early, I think, for its appearance, as we left on Sept. 17th. *Pyrameis cardui*, *Vanessa atalanta*, *Parage egeria*, and the two whites, *Pieris rapæ* and *P. brassica*, were not very common, but *Lycæna argiolus* was abundant. During the end of August *Mucroglossa stellatarum* was common always. There was only rain on two occasions, and then only showers, but from Christmas to Easter it *does* rain.—G. MEADE-WALDO; Eaton College.

PLUSIA MONETA, &C., AT FINCHLEY.—*P. moneta* appears to be fairly well established here, as by searching *Aconitum* I have taken the larvæ in three gardens widely apart. Night-searching for larvæ at Hampstead during the past two weeks has resulted in my taking *Noctua dirapezium*, which species, however, is not so plentiful as has been the case hitherto. *Noctua triangulum*, *N. festiva*, *N. augur*, *N. baia*, *Triphæna fimbria*, *T. comes*, *Mania typica*, *Leucania lithargyria*, *L. impura*, were all more or less plentiful.—V. E. SHAW; 8, Moss Hall Grove, North Finchley, May 29th, 1902.

COLIAS HYALE IN 1902. — I took a male *C. hyale* here to-day, not far from where I took two specimens on Oct. 20th last year. Are we going to have another clouded-yellow year? — PERCY E. FREKE; Folkestone, May 25th, 1902.

COLIAS EDUSA IN 1902. — To-day one of my boys, who was playing cricket at Felixstowe, saw one of these butterflies in a field where clover and vetches were growing. He gave chase to it and nearly knocked it down with his cap. There were a few gleams of sun during the afternoon, but otherwise it has been a cold unseasonable day and, considering the wet wintry kind of weather we have experienced since the last week of April, it is rather strange that this species should have put in an appearance. It can scarcely have been an immigrant. GERVASE F. MATHEW; Dovercourt, Essex, June 11th, 1902.

EUPITHECIA TRISIGNARIA IN SCOTLAND. — I have been fortunate in rearing several specimens of this insect from larvæ taken on *Angelica sylvestris* last September in Argyleshire. I cannot ascertain whether it has hitherto been noticed in Scotland, and this record of it may therefore be interesting. It certainly does appear in the Clyde District list published last summer. — JOHN A. NIX; 20, Hans Place, S.W.

AMPHIDASYS BETULARIA VAR. *DOUBLEDAYARIA* IN ESSEX. — On May 27th I bred a fine example of the above from a larva taken here last autumn. This is the first time I have observed the variety in this district. To-day I bred another, a very interesting variety, thorax and abdomen black, front part of head white, wings nearly black, dusted here and there with white atoms. — GERVASE F. MATHEW; Dovercourt, Essex, June 11th, 1902.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON. — *May 7th, 1902.* — The Rev. Canon Fowler, M.A., D.Sc., F.L.S., President, in the chair. — Mr. Charles R. Chichester, B.A., M.B., L.R.C.P., of Bathurst, Gambia, West Africa, and Clonmore, Co. Cork; and Mr. J. H. Lewis, of Ophir, Otago, New Zealand, were elected Fellows of the Society. — Mr. H. W. Shephard-Walwyn exhibited a gynandromorphous specimen of *Anthocharis cardamines*, taken near Winchester in 1899. The left side was that of a normal male, the right that of a normal female, with the exception of a splash of orange pigment on the under side of the primary. — Mr. H. Goss exhibited male specimens of *Saturnia carpi* from Essex, bred on whitethorn, and three males of the same species caught in Surrey by the aid of bred virgin females. He remarked that as a rule bred specimens were smaller than wild, but the bred Essex specimens were much larger than those captured in Surrey. The Essex specimens were light in colour, while the Surrey specimens were not only much smaller in size, but very dark, probably because their larvæ had fed upon *Erica* or *Calluna*. — Colonel C. Swinhoe announced the emergence of *Cossus ligniperda* in the Zoological Society's Gardens from a pupa received in a piece of wood from South

Africa, and said that it was remarkable that the species should have been introduced there, and then brought back to Great Britain.—Professor E. B. Poulton exhibited two *Euploina* captured in Fiji by Professor Gustave Gilson, and presented by him to the Hope Department. The species, which belonged to the different genera *Nipara* and *Deragenia*, bore the closest superficial resemblance to each other, affording an interesting example of Müllerian or Synaposematic likeness. — Professor Poulton also exhibited several specimens of *Dilina populi* which had been exposed during the pupal stage to the intense heat of July, 1900. In consequence of this “forcing” the moths emerged towards the end of that month, and were markedly different in colour from the normal, being much paler in tint with less distinct markings, and the red of the hind wings of a very different shade. They were also smaller, but this effect may have followed from the larvæ having been brought up under artificial conditions in the Oxford Museum.—The Rev. A. E. Eaton exhibited drawings illustrating the wing of *Pampterinus latipennis*, Etn., MS., a remarkable dipterous fly of the family Psychodidæ, from New Guinea, in the collection of the Hungarian National Museum, Budapest.—Prof. L. Compton Miall, F.R.S., contributed a paper “On a New Cricket of Aquatic Habits, found in Fiji by Professor Gustave Gilson.” Mr. R. McLachlan said this was not the first time an orthopteron of aquatic habits had been noticed. Mr. Pascoe had brought back one such insect from the Amazons, which leaped on the leaves of aquatic plants, and there was a recent record of another species with kindred habits being found in Java. Professor E. B. Poulton remarked that Professor Miall was interested in insects which skate upon the water, but there were also some Orthoptera which were aquatic in another sense. Mr. Annandale had brought back from the Malay region an aquatic insect of this order (a *Blatta*), which was far too heavy to skim upon the surface. The President added that there were some Coleoptera which, although non-aquatic, were so specialized as to be able to use their limbs in a similar manner to water-beetles.—Dr. T. A. Chapman, M.D., F.Z.S., communicated a paper on “Asymmetry in the Males of Hemarine and other Sphinges.”—Mr. E. Meyrick, B.A., F.Z.S., communicated a paper on “Lepidoptera from the Chatham Islands.”—H. ROWLAND-BROWN, *Hon. Sec.*

SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY. — *April 24th, 1902.*—Mr. F. Noad Clark, President, in the chair. — Mr. C. R. L. Boxer, of Lee, was elected a member. — Mr. Harrison exhibited a long series of *Taniocampa opima*, bred from ova collected at Wallesey, Cheshire. More than half the specimens were of an extremely dark coloration, and very few of the type form.—Mr. Main, numerous species he had collected in the New Forest at Easter.—Mr. Kaye, a very fine series of *Heliconius lindigii* taken in British Guiana, on the Rio Potaro; and also specimens of the Hymenoptera *Melittia ceto* and *M. caudatum*, both from South America.—Mr. R. Adkin, a series of dark forms of *Psilura monacha*, bred from a New Forest parent taken in 1901.—Mr. Moore, the Orthoptera *Polyspilota striata* and *Tenodera aridifolia* from Africa; *Ilterodula vitula* and *Creoboter urbana*, from Sylhet.—Mr. Colthrup, a var. of *Abraxas grossulariata*,

in which the black markings were extended, some coalescing into bands; and a specimen of *Cicada montana* from the New Forest, found close to the pupa-case from which it had just emerged. Rev. F. Perry, a large number of insects from South Africa, including stages of the migratory locust, a wasp which preys upon spiders, Hemiptera showing mimicry, &c.—Mr. Edwards, several species of the Nymphaline genus *Prepona*, and the various species and races of the *Agamemnon* group of *Papilio*.—Mr. Turner, a specimen of the harlequin beetle, *Acrosinus longimanus*, from Trinidad.—Mr. Sich read a paper on "The Lesser British Lepidoptera," and exhibited a large number of species typical of the various groups.

May 8th.—The President in the chair.—Messrs. Harrison and Main exhibited a very varied series of *Taniocampa incerta*, from Delamere Forest, Epping Forest, and Liverpool.—Mr. Moore, *Papilio ptyolichus*, male and female, from the Solomon Isles, and *P. erectus* from New Guinea.—Mr. Scourfield gave an address on "Lakes, and their Scientific Investigation," with diagrams.—HY. J. TURNER (*Hon. Rep. Secretary*).

RECENT LITERATURE.

CLAUDE FULLER. "First Report of the Government Entomologist, 1899-1900." Natal Dep. Agric., 1901, pp. iv. and 150; twenty-five plates and numerous text figures.

OUR Colonial Governments have in general far from recognized the pressing need for agriculturists of adequate entomological guidance, and we welcome this first report of the recently established Entomologist in Natal. The work is more in the nature of a general guide to the principal insect pests of the country, with notes for their prevention and destruction, than a special report, and is of a thoroughly practical nature, filling up a distinct gap, as our previous knowledge of African insect-pests was somewhat fragmentary. We hope to see many of these reports from the pen of Mr. Fuller in the future.

G. W. K.

H. OSBORN and E. D. BALL. "A Review of the North American Species of *Athysanus* (Jassidæ)," 1902, Ohio, Nat. ii. pp. 231-57, plates 16 and 17 [also forming Ohio Univ. Bull. (6) 14. 7th Contrib. from Dep. Zool. and Ent.].

RECENTLY (Entom., 1901, p. 336) we had occasion to notice the useful work by the above authors on some obscure American Homoptera of special interest to entomologists in this country, on account of the close relation of the forms treated to their allies of the European fauna.

In the present paper the difficult genus *Athysanus* is dealt with, three new subgenera being separated from Burmeister's original group. Twenty-six species (not including four doubtful) are now accredited to North America, and of these, three are also European, viz. *A. striola* (Fall.), *A. obsoletus*, Kirschbaum, and *A. striatula* (Fall.).

G. W. K.

Butterflies and Moths of Europe. By W. F. KIRBY, F.L.S., F.E.S.
With fifty-four coloured plates. 4to. London, Paris, New
York, and Melbourne: Cassell & Co. 1902.

It is satisfactory to find that the British interest in European Lepidoptera is large enough to induce Mr. Kirby to produce a revised and greatly extended edition of his popular work on the subject. Apart from the fact that much new matter, and some illustrations, have been added to the text, new coloured plates have been specially prepared for this re-issue. The plates in parts 1, 2, and 4, which we have received, are exceedingly well executed, and far superior in every way to those in the previous edition.

The arrangement and nomenclature of the first edition have not been materially altered, and as a result the work will be found, as regards these matters at least, to differ very little from most of the books on European Lepidoptera published during the past fifty years or so.

Proceedings of the South London Entomological and Natural History Society. 1901. Pp. 76. With two plates. Published at the Society's Rooms, Hibernia Chambers, London Bridge, S.E.

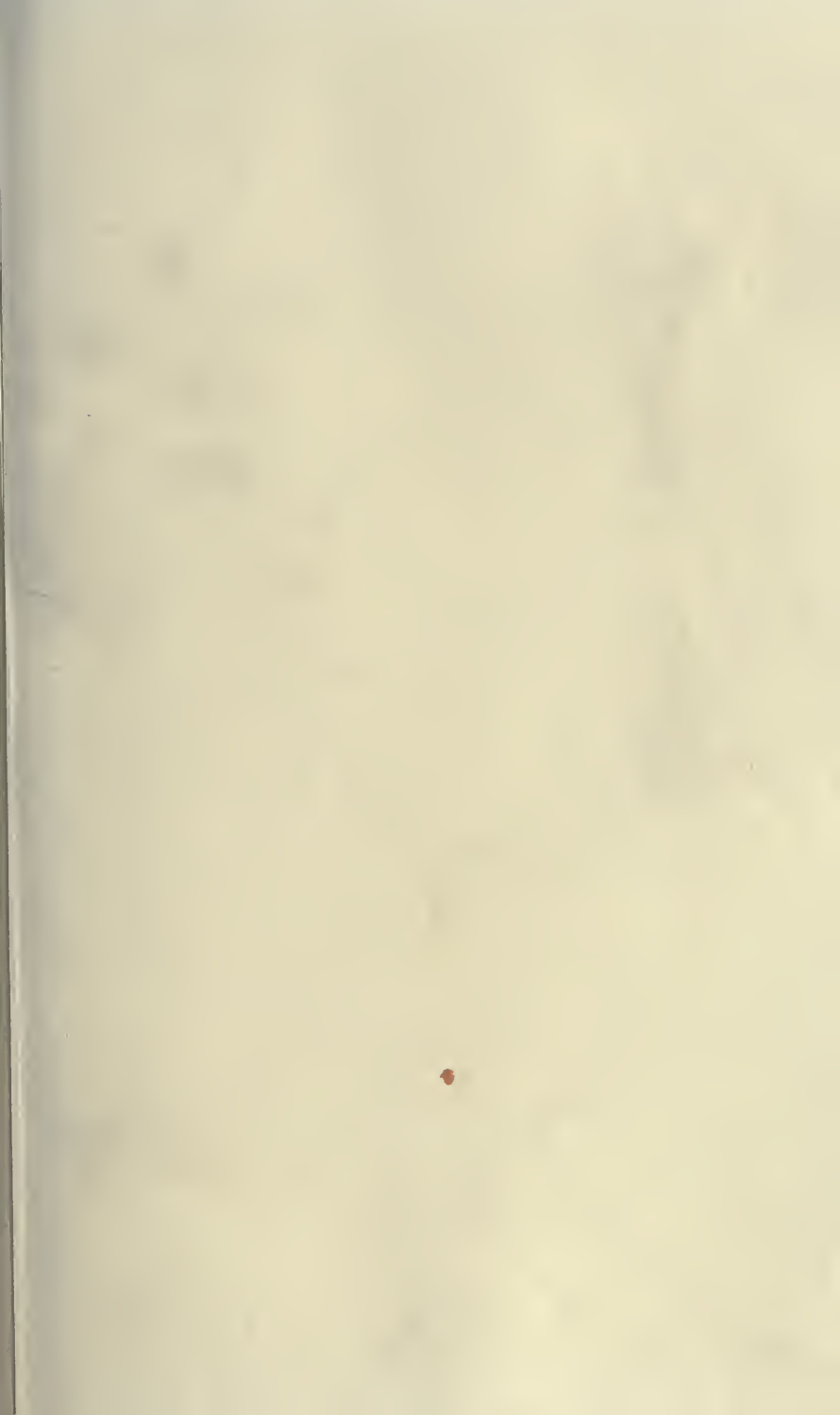
IN addition to reports of the five field-meetings held during the year, this volume contains two papers: one on "Fossil Insects," by Mr. W. West, and the other by Mr. A. M. Montgomery, entitled "Notes on Rearing Lepidoptera." We most heartily commend the latter to the notice of all who are interested in the observation of Lepidoptera in their early stages. The author seems exceptionally happy in devising means of obtaining ova from butterflies as well as from moths, and his methods of treating larvæ, from the time of leaving the egg until they attain full growth, are admirable. The paper is illustrated by two plates.

From the Report of the Council we learn that the membership of this firmly established Society is rather larger than in the previous year, the exact number for the year being one hundred and seventy-four. Judging from the nature of the exhibits, as set forth in the "Abstract of Proceedings," the business transacted during the session was thoroughly in touch with the objects of the Society.

Transactions of the City of London Entomological and Natural History Society. Part XI. (1901). Pp. 73. The Society's Rooms, London Institution, Finsbury Circus, E.C.

THE "Reports of Meetings" afford, as usual, interesting and instructive reading. The nomenclature adopted is very decidedly up-to-date, and in most cases the average student will no doubt experience little difficulty in following it; without previous introduction, possibly not a few may fail to recognize such old familiar friends as *Colias edusa* and *Taniocampa stabilis* under the combinations *Eurymus croceus* and *Graphiphora cerasi*.

There are three papers dealing with collecting during holidays at Hunstanton, Folkestone, and New Forest, as well as an important one on the genus *Cideria*. The latter is by Mr. Louis B. Prout, who also contributes a further instalment of the Lepidoptera of the London District.





H. Rowland-Brown Prof. E. B. Poulton. H. St. J. Donisthorpe. Dr. David Sharp. M. Jacoby. Rev. F. D. Morice. R. McLachlan. H. H. C. J. Druce.

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VISIT OF THE ENTOMOLOGICAL SOCIETY OF LONDON TO OXFORD.

(PLATE II.)

THE members of the Council and Fellows of the Entomological Society, who had accepted Professor E. B. Poulton's kind invitation to visit Oxford, assembled in the Hope Department of Zoology in the Museum on Saturday, July 5th. After a pleasant afternoon spent in inspecting the collections, now in process of rearrangement, an adjournment was made to Jesus College, where Professor Poulton entertained the following members of the University and Fellows of the Society: the Vice-Chancellor, Mr. D. B. Monro, Provost of Oriel; Mr. A. B. Poynton, Senior Proctor; Mr. A. J. Evans, Keeper of the Ashmolean Museum; Professor Dixey, Dr. David Sharp, Mr. R. McLachlan, Professor Meldola, the Rev. F. D. Morice, Colonel Swinhoe, Mr. A. J. Chitty, Mr. M. Jacoby, Mr. Hamilton Druce, Mr. H. St. J. K. Donisthorpe, Mr. Guy Marshall, and Mr. H. Rowland-Brown. While of the uninvited but appropriate (!) guests who put in an appearance was the rare *Reduvius personatus*, Linn., taken by Professor Poulton on the college wall, crawling up toward the electric light. On Sunday tea was served in one of the meadows that border the Cherwell, after a pleasant pull on the river, now in all its summer freshness, and the haunt of innumerable Odonata, of which *Calopteryx splendens* and *Æschna cyanea* were perhaps the commonest and most admired. Later in the

day Colonel Swinhoe and Professor Dixey invited a number of Fellows to their high table in Wadham, in the beautiful garden of which college the party ended what must certainly be considered not the least successful of the many hospitalities. Professor Poulton and the entomological Fellows of the University of Oxford have so kindly extended to the Council and Fellows of the Entomological Society of London.

H. R-B.

ON CARNIVOROUS LYCÆNID LARVÆ.

BY E. ERNEST GREEN, F.E.S.
(Government Entomologist of Ceylon.)

In the June number of the 'Entomologist,' Mr. F. P. Dodd describes an interesting larva of an Australian Lycænid (*Liphyra brassolis*, Westw.) from nests of an ant, *Ecophylla smaragdina*. Mr. Dodd gives reasons for believing that the larvæ prey upon the grubs of the ants; but has failed to rear any by providing them with that food.

That the larvæ are really carnivorous seems to be proved by the fact that they seized and attempted to eat some of the grubs; but they do not appear to have been satisfied with that diet. Is it not possible that their proper food may be some Coccid enclosed in the ant's nests? In Ceylon, the arboreal nests of this same ant almost invariably include colonies of Coccidæ, Aphidæ, or Aleurodidæ. We have here also a coccidophagous Lycænid larva (of *Spalgis epius*, Westw.). I have on more than one occasion found them inside nests of another tree ant, *Cremastogaster dohrni*, feeding upon "mealy bugs" (*Dactylopius* sp.) enclosed therein.

The larvæ of another Ceylonese Lycænid (*Aphnæus lohita*, Horsf. = *lazularia*, Moore) frequent the nests of *Cremastogaster* on Acacia and Grevillea trees, upon the foliage of which they feed. These larvæ carry a dorsal honey-gland near the posterior extremity of the body, and are cultivated by the ants on that account. They are herded in special shelters built by the ants, are driven out at night to feed, and brought back to their shelters each morning.

Peradeniya, Ceylon: June 20th, 1902.

DESCRIPTIONS OF SOME NEW SPECIES OF PHYTO-PHAGOUS COLEOPTERA FROM THE ISLAND OF MAURITIUS.

By MARTIN JACOBY.

IN the 'Transactions' of the Entomological Society of London for 1898 I have already described several species from the above locality, which were obtained by Mons. Alluaud, of Paris. I have now received some other species from the same gentleman, which, although closely allied, seem again different, and of which I give the descriptions here.

CÆNOBIUS SULCICOLLIS, sp. n.

Black, the labrum flavous; thorax impunctate, deeply obliquely sulcate at the sides; elytra moderately deeply punctate-striate, black, shining, with a transverse flavous spot at the middle of the disc. Length, $3\frac{1}{2}$ mill.

Head black, nearly impunctate, the clypeus broad, with a few punctures; eyes extremely large, occupying the entire sides of the head and nearly joined at the vertex, deeply notched; antennæ subfiliform, the lower four joints fulvous, the rest black, basal joint elongate, second one short, third and fourth joints equal, the others slightly thickened and shorter; thorax transverse, narrowed anteriorly, if viewed from above, the sides greatly deflexed, the lateral margins rounded, anterior margin accompanied by a deep groove, the surface entirely impunctate and shining, black, the sides with a deep oblique groove at the middle, extending nearly to the middle of the disc, the basal margin slightly produced at the middle and truncate at that place; scutellum subquadrate; elytra short and parallel, rather deeply punctate-striate, the punctures very fine near the apex, the interstices flat and impunctate, those near the lateral margins convex, shoulders rounded and prominent, the surface black and shining, with a small transverse flavous spot at the middle of the disc; below and the legs black; prosternum broader than long, the base concave.

The structural characters in regard to the antennæ and the thorax scarcely fit in any of the different genera of Cryptoccephalidæ, but the large and nearly joined eyes and the broad prosternum are characters peculiar to *Cænobius*; the deep thoracic groove in connection with the coloration will at once distinguish the species.

RHYPARIDA BIMACULICOLLIS, sp. n.

Obscure testaceous or fulvous; antennæ (the basal joints excepted) black; thorax impunctate, with two black spots; elytra strongly punctate-striate, the interstices minutely wrinkled, the sides broadly and the suture very narrowly black. Length, 5 mill.

Of oblong parallel shape; the head impunctate, opaque, obscure fulvous, with a deep central groove at the vertex; clypeus separated by another very deep transverse groove, its anterior margin concave, the surface finely and sparingly punctured; labrum fulvous; antennæ

slender, the lower three joints fulvous, the rest black, the second and third joints equal, each shorter than the fourth; thorax transverse, the sides rounded, the anterior angles pointed, the basal margin preceded by a narrow but deep partly punctured groove, the surface impunctate, very minutely granulate, with a rather large black spot at each side; scutellum piceous; elytra subcylindrical, strongly punctate-striate, the punctures much finer towards the apex, the interstices here and there finely wrinkled, the suture narrowly and the sides more broadly black, this colour at the latter place abbreviated near the apex; below and the legs fulvous, the posterior femora with a small tooth.

This species—the only one known at present from Mauritius—resembles much in coloration many Australian forms of the genus, but may be separated by the impunctate and maculate thorax, and the markings of the elytra; the latter are somewhat variable, and probably sometimes either entirely absent or more strongly marked. The structural characters are entirely those of the genus *Rhyparida*.

TRICHOSTOLA PUNCTICOLLIS, sp. n.

Black below, above greenish cupreous, clothed with white pubescence; the basal joints of the antennæ and the legs fulvous; thorax very strongly punctured; elytra very closely and equally strongly punctate. Length, 2 mill.

Head metallic greenish, strongly but sparingly punctured, clothed with single long white hairs; labrum fulvous; antennæ extending nearly to the end of the elytra, black, the lower three or four joints fulvous, third and fourth joints rather slender, equal, the following joints slightly thickened; thorax about twice as broad as long, the lateral margins rounded, the surface very closely and deeply punctured, cupreous, sparingly pubescent; elytra with a feeble transverse depression below the base, punctured like the thorax, the punctuation arranged in very close rows, the interstices scarcely defined, with a few fine punctures, partly transversely wrinkled and clothed with white hairs; below black, legs fulvous.

I know of no other species of this genus having an equally strongly punctured thorax. *T. rugulosa*, Fairm., is described with a pale fulvous pubescence, and with a finely rugose thorax and elytra; the antennæ are also described as fulvous.

TRICHOSTOLA THORACICA, sp. n.

Below black; antennæ and legs fulvous, above obscure cupreous; thorax transverse, finely rugosely punctured, clothed with grey pubescence; elytra finely punctate-striate, the interstices finely wrinkled and pubescent. Length, 3 mill.

Head finely rugose and pubescent, dark cupreous, opaque; antennæ fulvous, the last joint darker, third joint distinctly shorter than the fourth; thorax more than twice as broad as long, of equal width, the sides scarcely deflexed, the lateral margins rounded, the surface sculptured like the head, and clothed with grey pubescence; elytra with a

slight transverse depression below the base, rather finely punctate-striate, more distinctly so at the sides; the interstices likewise finely punctured, slightly wrinkled and pubescent; legs fulvous.

The general coloration of this species is opaque cupreous, and the thorax is less narrowed anteriorly than is generally the case; the elytral punctured striæ are not so well defined as in most of its allies, owing to the somewhat wrinkled interstices.

TRICHOSTOLA FASCIATIPENNIS, sp. n.

Pale fulvous or ferrugineous, closely pubescent; thorax clothed with yellow pubescence; elytra strongly punctate-striate and pubescent, pale fulvous, the suture and a short discoidal stripe at the disc fuscous. Length, 2 mill.

Head smooth, not perceptibly punctured, the lower portion and the palpi flavous; antennæ fulvous, the terminal five or six joints fuscous, thickened; thorax more than twice as broad as long, the sides feebly rounded, slightly narrowed anteriorly, the basal margin sinuate at each side, surface sculptured and pubescent like the head; scutellum similarly clothed with yellow hairs; elytra with regular and rather closely placed rows of deep punctures, the interstices pubescent, fulvous, the suture narrowly fuscous, the middle of the disc with a short more or less distinct fuscous stripe, not extending to the base or apex; below and the legs coloured like the upper surface.

The general coloration of this species differs from any of its allies, but the elytral stripe is sometimes obsolete or absent.

TRICHOSTOLA FEMORALIS, sp. n.

Below obscure fulvous; the terminal joints of the antennæ and the breast fuscous; above obscure æneous, clothed with fulvous hairs; thorax extremely finely, elytra more distinctly punctured in indistinct rows, the interstices finely and sparingly punctate; legs fulvous, the apex of the femora and tibiæ fuscous. Length, 5 mill.

Of comparatively large size; the head obsoletely punctured and furnished with some fulvous hairs, the anterior margin of the clypeus and the labrum fulvous; antennæ extending to about the middle of the elytra, the lower four or five joints fulvous, the others black, the third and following two joints slender and equal, the rest slightly thickened, shorter; thorax more than twice as broad as long, slightly narrowed anteriorly, the sides rounded, the punctuation very fine and close, the interstices furnished with fulvous pubescence, the posterior margin straight at the sides; scutellum pubescent; elytra with a feeble depression below the base, punctured in rows, rather difficult to distinguish on account of the close and but little less strongly punctured interstices, the latter also clothed with longish fulvous hairs; abdomen and legs fulvous, the femora with a fuscous spot or patch near the apex; the tibiæ more or less similarly coloured at the base.

One of the largest species of the genus, of obscure æneous or cupreous coloration; the punctuation of the thorax and the elytra close and fine; the legs marked with fuscous,

ON SOME NEW GENERA AND SPECIES OF HYMENOPTERA (ICHNEUMONIDÆ, CHRYSIDIDÆ, FOSSORES, AND APIDÆ).

By P. CAMERON.

(Continued from p. 183.)

CHRYSIDIDÆ.

CHRYSIS (TETRACHRYSIS) LEPCHA, sp. nov.

Viridis, supra late cæruleo; antennis tarsisque nigris; alis fusco-violaceis. Long. 14 mm. ♀.

Hab. Khasia (coll. Rothney).

Antennæ black; the basal three joints bluish above; the base of the scape broadly green; the flagellum, except at the base, covered with a pale down. Head green, tinged with blue; the front brassy in the middle; the ocellar region purple; the apex of the clypeus and the mandibles, except at the base, black. The vertex coarsely and deeply punctured, the punctures larger and deeper at the sides near the eyes; the front closely punctured in the middle; the sides much more strongly punctured; the eyes are bordered by a distinctly defined row of punctures; in the centre of the front above is a shallow depression; the orbits behind are bordered by a sharp distinct keel. Thorax above dark green; the base and a transverse band on the pronotum, and the centre of the meso- and metanotum, broadly purple; the pronotum coarsely and closely rugosely punctured, except a smooth impunctate space in the centre at the base, this space being broadest behind; the mesonotum and the scutellum have the punctures larger and deeper, especially in the middle; the middle of the metanotum is punctured like the scutellum, its sides near the wings depressed; the projecting lateral angles are coarsely punctured at the base; the outer sides at the apex have two slight depressions. The upper part of the propleuræ coarsely punctured; the middle is depressed, and bears a few irregular striæ; below this depression is a deeper narrower longitudinal one; mesopleuræ deeply and largely punctured, the punctures running into reticulations. Mesosternum brassy, closely punctured behind; the sides and middle with stronger punctures. The metapleuræ are irregularly longitudinally striated, the striæ being stronger and more widely separated at the base. Legs green, largely mixed with blue; the tarsi black. Wings fuscous, paler towards the apex; the nervures deep black. The basal segment of the abdomen is bluish green; the sides with a distinct brassy tinge; the base and sides are strongly punctured; the centre has the punctures more widely separated and smaller; between the larger punctures are smaller ones. The second segment is closely punctured, the punctuation on the sides being closer and stronger than on the middle, and they have a brassy tint; the third segment is finely and sparsely punctured at the base, the rest of it much more strongly and closely punctured; the apical depression is wide and deep; the foveæ are also deep; the four teeth are large; the outer broader than the inner, and somewhat triangular.

This is considerably larger than any of the other species of this section.

MUTILLIDÆ.

MUTILLA CASIPHIA, sp. nov.

Black ; the basal three segments of the abdomen red ; the scutellum with a narrow deep furrow down the centre ; the area on the median segment reaches to the apex of the truncation, and becomes gradually narrowed ; wings violaceous, paler at the base. ♂. Long. 18 mm.

Hab. Borneo.

Antennæ short, the flagellum opaque ; the third joint slightly longer than the fourth, which is of the length of the fifth. Head narrower than the thorax, densely covered with long griseous hair ; on the cheeks the hair is longer, denser, and bright silvery in tint. Front and vertex coarsely rugosely punctured ; the face and clypeus smooth and shining ; on the centre, above the clypeus, is a conical projection, the narrow part being above ; the clypeus is depressed below it, and foveate on either side of its apex. Mandibles broad ; the apical tooth broad, broadly rounded at the apex, the subapical tooth transverse ; at the base, behind the middle, is a large blunt tooth, which projects downwards ; the base is thickly covered with grey pile, and with silvery hair ; the palpi are black. Pro- and mesothorax closely and strongly punctured ; the mesopleuræ and sternum thickly covered with silvery pubescence ; the mesonotum thickly with longish blackish hair ; the scutellum and post-scutellum with long black hair ; there are two furrows on the apical two-thirds of the mesonotum, a smooth flat keel between them, and a shorter one on either side. Scutellum roundly convex, rugosely punctured ; there is a furrow in the centre of the apical two-thirds, bordered by flat smooth keels, and there is a flat smooth keel at its base. Median segment coarsely and regularly reticulated ; there is a central area which reaches to the top of the truncation ; it is wide at the base, and becomes gradually narrowed to the apex, which is not quite one-half the width of the base. Propleuræ closely rugosely punctured, the apex smooth, with some stout striæ behind. Legs thickly covered with white hair ; the spurs pale. Wings deep fusco-violaceous, paler at the base ; the pale space on the hinder wings more extended than on the front ; the third cubital cellule at the top and bottom is distinctly shorter than the second ; the apex of the radius is obliquely bent upwards, is straight, and at a different angle from the lower part ; the first transverse cubital nervure is rounded, and has an oblique slope ; the second is not oblique, and has a broad rounded curve ; the third is sharply angled in the middle ; both the recurrent nervures are received shortly, but distinctly beyond the middle. The apical half of the first and the whole of the second and third segments are rufous ; the basal five segments are covered with white, the apical more thickly with longer black hair ; the ventral keel is stout, does not extend beyond the middle, and is roundly but not deeply curved below. The pygidium has an elongated bare space, narrowed at the top and bottom in the centre ; the sides on the basal two-thirds are covered with long black hair ; the apex is sparsely but not strongly punctured ; the hypopygium is flat, covered with long black hair, and not keeled.

MUTILLA AESYCA, sp. nov.

Black; the head and thorax red; the front femora and the basal three-fourths of the four posterior rufous; the lower part of the petiole rufous; a quadrate spot on the centre of the petiole, a broad band on the apex of the third segment, widest in the middle, the apex of the penultimate, and the sides of the last segment covered with silvery pubescence. ♀. Long. 11 mm.

Hab. Borneo.

Antennæ entirely black; the third joint more than double the length of the fourth; the fourth and fifth equal in length. Front and vertex rugosely punctured, and sparsely covered with longish black hair; the front indistinctly keeled down the centre. Antennal tubercles dark rufous, smooth. Mandibles black, rufous at the apex; their base punctured; their apical tooth long, rounded at the apex; the hair on their base long and pale fulvous. The head is broader than long, but is largely developed behind the eyes; the occiput is roundly incised, not transverse or convex. Thorax twice longer than broad; the base and apex almost transverse, with their sides rounded; the outer edge of the mesonotum is irregular; the sides of the apex above bear four stout teeth. The top of the median segment has a rounded slope; it is sparsely punctured, and is keeled down the centre. Pleuræ smooth and shining; the upper part projects. Legs black; the front femora entirely, and the four posterior, except at the apex, rufous; they are covered with long white hair; the tibial spines apparently are few in number, and are black; the spurs are pale; the tarsal spines are rufous; their basal joints are thickly covered with pale pubescence. The abdomen deep black; there is a square mark of silvery pubescence on apex of the petiole, in the middle there is a broad band of similar pubescence, broadest in the middle, on the apex of the second segment; a broader one on the penultimate, and the sides of the pygidium are thickly covered with silvery pubescence; the last segment is punctured at the base; the apical half is smooth, shining, and piceous. The keel on the basal ventral segment does not project much, and is rounded at the base and apex; the second segment is smooth and depressed on the basal half, and is there indistinctly keeled in the middle; the epipygium is closely punctured, and is distinctly bordered laterally. On the side of the second segment is an elongated patch of dark rufous pubescence.

(To be continued.)

A LIST OF TORTRICES TAKEN IN SOUTH ESSEX BETWEEN 1885 AND 1901.

By A. THURNALL.

(Concluded from p. 193.)

Catoptria wimmerana, Wilk.—Strictly confined to the salt marshes along the Thames, and on the coast. Wakering, near Shoeburyness, Thames Haven, Fobbing, and Benfleet. Larva in September and October spun up in the tops of *Artemisia maritima*.

C. cana, Haw.—Very common amongst thistles, in the heads of which the larva may be found in abundance in September. From one of several larvæ taken near Clacton in September, 1888, I bred a female in 1890. This is the only instance known to me of this species taking two seasons to arrive at the perfect state.

C. scopoliana, Haw.—Fairly common amongst *Centaurea nigra*, in the heads of which the larva feeds. Much more commonly met with some seasons than others. Its near ally, *fulvana*, St., I have only met with in the north of the county, strictly confined to *Centaurea scabiosa*.

C. cæcimaculana, Hb.—Apparently rare and local in the county. I once took a pair amongst *Centaurea nigra*, &c., on a piece of chalky waste ground near Grays, but unfortunately lost the boxes, so that I am still without any Essex examples!

C. æmulana, Schl. — Strictly confined to places where its food-plant, golden-rod, grows. I have found the larva very sparingly between Brentwood and Ingatestone. Very much more abundant on the Kentish side of the Thames, from whence I have bred it freely.

C. tripoliana, Barr.—I have found this variable species wherever *Aster tripolium* grows in the "saltings." The larva may be found full-fed early in October in the seed-heads. Not difficult to breed if kept fully exposed to all weathers.

C. expallidana, Haw.—Very local; I have only met with it in a rough field not far from Upminster early in July.

C. citrana, Hb.—Mr. Machin used to get this species sparingly on the sloping banks between Southend and Leigh, but I fear it is not likely to be met with there now. Still occurs, I believe, on Canvey Island. Larva feeds in flower heads of *Achillea millefolium*.

Trycheris aurana, Fb.—Local; I have netted a few in rough fields near Hadleigh, but I am told that it occurs in many places.

Lobesia permixtana, Hüb.—Very abundant in Epping Forest, Brentwood district, and many other places, generally amongst oak. I have never met with the larva to my knowledge, but it has been bred from blackthorn and birch. It is almost sure to be found on oak as well some day.

Eupeçilia nana, Haw.—Common amongst birch shrubs generally. I once bred two specimens from a dead thistle stem, much to my surprise, until I came to recollect that the stem was picked (in Wanstead Park) from beneath a birch tree.

E. dubitana, Hb.—Rather local. Wanstead, Upminster, Waltham Abbey, Danbury, Wakering, &c. I have bred it from golden rod, *Hieracium tridentatum* and *umbellatum*, and *Senecio jacobææ*. Feeds on the young seeds in September.

E. atricapitana, St.—Local and uncommon in South Essex. I have bred it once or twice from dead stems of *Senecio* from near Thames Haven, and the second brood from the green stems of the same plant from the railway bank near Harold Wood.

E. maculosana, Haw.—Not uncommon in plantations and woods where its food-plant, *Scilla nutans*, grows. The larva feeds on the green seeds in July, and then leaves to spin-up amongst rubbish. Very quick on the wing when flying in the sunshine over a bed of its food-plant. I have met with it in the woods round Warley more abundantly than elsewhere.

E. hybridellana, Hb.—Local and scarce; more abundant in the larva state. I have taken a very few not far from Pitsea, and found the little pinkish larva in abundance, feeding in the seed-heads of *Helminthia echinoides*, but I found it very difficult to breed.

E. angustana, Hb.—The small pale form sometimes swarming in early August over *Calluna vulgaris* at Loughton, Warley, Tiptree, &c. The much more handsome and earlier form (which feeds upon the seed of *Plantago lanceolata*, and, I believe, other plants) is much less common. Thames Haven, railway banks near Romford, also rough fields near Upminster. I was at one time inclined to think we had two species mixed up here.

E. vectisana, Westw.—Very common in the salt marshes amongst *Triglochin maritimum*, its food-plant. Mr. Machin met with a specimen on Hackney Marshes, where it had probably fed on the allied *T. palustre*.

E. affinitana, Dougl.—Common in every salting where *Aster tripolium* grows. I have found the pupa in the spring in the upper part of the previous season's flower-stalks.

E. udana, Gn.—Seldom seen on the wing, but the larva may be found in most places in the stems of *Alisma plantago*, pupating therein. The insects last over a considerable time; this summer, for instance, I bred one on June 11th, and the next specimen came out on July 12th!

E. notulana, Zell.—I have never bred this insect or met with the imago in Essex; but in 1886 I found, near Brentwood, in the early autumn, several larvæ in stems of *Mentha aquatica*, which were no doubt this species, but I failed to rear any of them.

E. ruficollis, Curt.—Scarce and local. I have found the larva on the banks of the Chelmer, near Chelmsford, in the old prostrate stems of *Eupatorium cannabinum*, but this plant is by no means common in the districts where I have collected.

E. roseana, Haw.—May generally, but not always, be found in the larval state in heads of the common teasel. Harold Wood, Bensfleet, Pitsea, and Canvey Island. From the last named locality I bred the largest and most beautifully coloured specimens I have seen.

E. ciliella, Hb.—Only met with at Ingatestone, where a few larvæ were found feeding in the seeds of the common cowslip, *Primula veris*.

E. implicitana, H. S.—Not rare; may be found among such plants as *Anthemis cotula*, *Matricaria inodora* and *chamomilla*, in the seed of which the larva feeds, often, but not always, pupating in the stems. I have also bred it freely from flowers or seeds of golden rod from Kent.

E. erigerana, Wlsm.—Very local in South Essex. I have only met with it once on a piece of waste ground near Harold Wood. I found it very abundantly near here (Croydon), and also bred it from flower-heads of *Erigeron acer* a few weeks ago (August, 1901).

Xanthosetia zoegana, L.—Not common, but very widely distributed. I have taken the very striking var. *ferrugana*, Haw., near Stratford, on Leyton Marshes.

X. hamana, L.—Very common and variable amongst the various species of thistle in every locality I have worked. The larva is said to feed on thistles, but I have never met with it.

Chrosis tessarana, Tr.—Common on rough, dry, waste grounds, and in great variety, some of which are very beautiful, others nearly or quite unicolorous. I once bred nearly forty from larvæ obtained the

previous autumn feeding on roots of *Helminthia echinoides*, and a few on *Picris*, on the railway bank near Stanford-le-Hope.

Argyrolepis baumanniana, Schiff.—Scarce and local in damp places amongst *Scabiosa succisa*, in the roots of which plant it is believed to feed. Near Brentwood, and beside the road leading from the 'Robin Hood' to High Beech, Loughton.

A. sub-baumanniana, Wilk.—Another scarce and local species. I have only met with it in a rough place on the chalk near Purfleet. I am inclined to think that *Scabiosa columbaria* roots will be found to be the food of the larva.

A. zephyrana, Tr.—Not uncommonly found where *Daucus carota* grows; in the root and lower part of the stem the larva may be found through the winter. Like so many other Tortrices, it is partial to railway banks.

A. maritima, Gn.—Entirely confined to those places on the coast where *Eryngium maritimum* grows. The larva may be found in the winter far down in the sand in the root of this somewhat local plant. I have bred a good number in past years from roots dug up in the neighbourhood of Clacton, but I expect the plant is scarce there now.

A. badiana, Hb.—Generally common amongst burdock, in the seeds (not the stems) of which the larva feeds, together with *Parasia lapella*, leaving when full-fed and pupating amongst rubbish on the ground.

A. cnicana, Dbl.—Mr. Machin used to take this amongst thistles, &c., in boggy places in Epping Forest. I have not met with it.

A. aneana, Haw.—This, perhaps the most beautiful of all our Tortrices, although local, is by no means rare in Essex. I have met with it (usually the larva) on the railway banks near Romford, Harold Wood, Stanford-le-Hope to Thames Haven, also at Fobbing, Benfleet, and near Upminster. The larva may be found in the autumn and winter in the roots of *Senecio jacobæa*, in which it pupates.

Conchylis dipoltella, Hb.—Another beautiful but far more local insect. Mr. Machin used to find the larva in seed-heads of *Achillea millefolium* near Southend; I have not met with it in any stage.

C. francillonana, Fb.—Locally common amongst its food-plant, *Daucus carota*. Harold Wood, Romford, and commonly near Upminster and Benfleet.

C. dilucidana, St.—More commonly found in the larva state in dead stems of *Pastinaca sativa* wherever it grows abundantly.

C. smeathmanniana, Fb.—Somewhat local among *A. millefolium* and *Anthemis cotula* on waste ground. Very common at Temple Mills, near Stratford, Romford, Blackmore, East Horndon, &c. I have found it difficult to breed.

C. stramineana, Haw.—Only met with at Harold Wood and near Pitsea, always amongst *Centaurea nigra*, in the heads of which the larva feeds.

Aphelia osseana, Scop.—Common as this curious species is in many places, I have only met with it on one occasion in South Essex, on a rough, dry slope near Upminster.

Tortricodes hyemana, Hb.—In great abundance in March in oak woods, and varying considerably; some of the specimens are rather pretty, but the majority of them plain. The female is less often met with; I once got a good many by searching the trunks of the oaks after dark.

DESCRIPTIONS OF NEW SPECIES OF HETEROCERA FROM THE TRANSVAAL.

By W. L. DISTANT.

THE following seven species have recently been added to my collection from various sources, and will be eventually figured in 'Insecta Transvaaliensia,' now in course of publication:—

Fam. NOCTUIDÆ.

TIMORA TRANSVAALICA, sp. n.

Head pale brownish, pronotum greyish-pink, abdomen dull ochraceous, sternum greyish-white. Anterior wings very pale carmine or pinky red, with a greyish ray extending from base to about middle of wing, above this a similar but longer ray margining lower area of cell and extending to apical margin, other narrower and more obscure greyish rays between the nervures; posterior wings creamy-white; anterior wings beneath much paler than above. Exp. wings 34 millim.

Hab. Transvaal; Johannesburg (J. Hyde).

AUDEA SUBLIGATA, sp. n.

Head, pronotum, and legs piceous; abdomen, sternum, femora above, and spots to tarsi ochraceous; disk, apex, and lateral margins of abdomen suffused with fuscous. Anterior wings above piceous; posterior wings somewhat obscure greyish, the basal area tinged with pale ochraceous, the veins mostly fuscous, and with a narrow marginal piceous fascia, the fringe greyish. Wings beneath greyish; anterior wings with the costal margin, subapical and apical fasciæ, and outer marginal spots piceous, cellular area fuscous; posterior wings with the posterior apical margin and a costal spot piceous. Exp. wings 38 millim.

Hab. Transvaal; Lydenburg district (Pret. Mus. and Coll. Dist.).

CHALCIOPE PRETORIÆ, sp. n.

Head pale ochraceous, its basal area and antennæ darker; pronotum with the anterior area ochraceous-brown posteriorly defined by a dark transverse castaneous line between the costal angles of the wings, beyond this the colour is pale luteous; abdomen dark ochraceous; sternum and legs pale luteous. Anterior wings pale ochraceous, sparingly speckled with small brown points; two small discal brown spots near base, an oblique costal spot near centre of cell, a reniform discal spot at end of cell preceded by a short costal stripe, followed by a curved series of minute spots crossing wing, the costal largest, all brown, outer marginal area very pale purplish brown, inwardly defined by a white line margined with brown and outwardly by three narrow contiguous whitish lines; posterior wings pale greyish, outer area tinged with pale ochraceous, the discal veins marked with a short fuscous streak. Exp. wings 52 millim.

Hab. Transvaal; Pretoria.

Allied to *C. carnicola*, Hamps.

Fam. NOTODONTIDÆ.

RIGEMA AURIFODINÆ, sp. n.

Head and pronotum golden-yellow; abdomen brownish-ochraceous, the base and apex greyishly pilose, and with a lateral marginal black fascia on each side; sternum and legs ochraceous, with yellow pilosity; tarsi spotted with black; antennæ pale ochraceous. Anterior wings stramineous, with a broad central longitudinal fascia, a shorter and narrower fascia from end of cell, and a very short subapical marginal streak, pale brownish-ochraceous with blackish speckles; posterior wings greyish-white; anterior wings beneath much paler than above. Exp. wings 37–40 millim.

Hab. Transvaal; Johannesburg (J. Hyde). Pretoria (Pret. Mus.).

CERURA SWIERSTRÆ, sp. n.

Head, pronotum, and body beneath hoary-white; a transverse ochraceous fascia preceded by a black suffusion between lateral pronotal angles; a spot at base of head, a transverse basal fascia to pronotum, abdomen above, head beneath, tibial spots, and the tarsi black; base and apex of abdomen above hoary-white; antennæ with the pectination fuscous. Wings hoary-white; anterior wings with costal and outer marginal spots and a speckled suffusion on outer basal area, black; posterior wings with a central subcostal spot and minute outer marginal spots as on anterior wings, black. Exp. wings 32 millim.

Hab. Transvaal; Pretoria (Swierstra—Pret. Mus. and Coll. Dist.).

Fam. COSSIDÆ.

DUOMITUS SQUAMEUS, sp. n.

Body above and beneath, with legs, greyish-brown; pronotum thickly irrorated with pale greyish scales; head and anterior margin of pronotum dark purplish; pectination of the antennæ dull ochraceous. Anterior wings brownish, thickly irrorated with grey scales; a purplish-brown patch occupying costal area for about one-third from base, where it is also about one-third of breadth of wing, a similarly coloured costal spot nearly above apex of cell; posterior wings greyish-brown; wings beneath somewhat uniformly greyish-brown. Exp. wings 58 millim.

Hab. Transvaal; Pretoria.

AZYGOPHLEPS LEOPARDINA, sp. n.

Head and pronotum pale yellowish-white; pronotum with a transverse fascia on anterior collar, two transverse series of four spots in each across disk, and four spots on posterior area—two laterally on each side—black; antennæ greyish-white, speckled with black, their bases broadly black; body and legs pale greyish-brown, tibiæ and tarsi more or less annulated with black. Anterior wings cretaceous-white, somewhat thickly and irregularly black spotted, on apical third the spots transversely crossing wing, before this, or on basal two-thirds,

the spots in more longitudinal series; posterior wings cretaceous, with obscure dark spots placed transversely on their outer areas; the veins of both wings more or less ochraceous; wings beneath as above, but anterior wings with the spots a little paler. Exp. wings 60 millim.

Hab. Transvaal; Pretoria.

ON THE MORPHOLOGY AND CLASSIFICATION OF THE AUCHENORRHYNCHOUS HOMOPTERA.

By DR. H. J. HANSEN.

(Continued from vol. xxxiv. p. 154.)

D. SPIRACLES AND ABDOMEN.*

As regards the number of spiracles, I do not know of any opinions founded upon research other than L. DUFOUR's erroneous statement (in 1833) for the number in *Cicada* (see above),† and WITLACZIL (in 1885) for *Typhlocyba*. In the above cited work, SCHIÖDTE remarks (p. 255): "Rhynchota Heteroptera have without exception ten pairs of spiracles, whose distribution is exactly as I pointed out long ago in the Coleoptera." That is to say, the first pair lie between the pro- and meso-sternum; the second pair between the meso- and meta-sternum; the third pair "on the insect's back concealed by the wings, between the metanotum and the first tergite of the abdomen" (p. 257); the fourth to tenth pairs "lie on the ventral part of the pleural-fold of the abdomen. There are thus seven pairs of ventral abdominal spiracles." In the types of all four families of the Auchenorrhyncha I have likewise found ten pairs of spiracles. In the location of the eight pairs of abdominal spiracles, one finds, moreover, features affording exquisite family characters, and some of these deviate from the rule formulated by SCHIÖDTE as being applicable to the Heteroptera. In discussing the abdominal spiracles it will be at the same time necessary to deal with some points in the structure of the abdomen, and each of the families must be treated separately as regards this; while, on the other hand, the thoracic spiracles appear not to offer special differences in the several families, and the latter can therefore be considered together.

a. THORACIC SPIRACLES.

1. *Spiracles between the pro- and meso-thorax* lie in the soft articulating membrane between these two sclerites, almost under

* A somewhat different account has been given of the spiracles by Verhoeff (1894, Verh. Naturh. Vereins Rheinlands, vol. 1. pp. 307-74; abstract in 1893, Entom. Nachr. xix. pp. 369-80), but Handlirsch has recently fully confirmed Hansen's account (1899, Verh. zool. botan. Gesellsch. Wien. xlix. pp. 449-510; see also 'Entomologist,' 1900, p. 20).—G. W. K.

† This refers to the Historical *résumé*, not translated.—G. W. K.

the root of the fore wings, either on the lateral margin of the body (*Cicada*), or a little under the same (*Aphrophora*). They are hidden by the flattened-out, broad, prothoracic lateral margin, and can be seen very easily when this is cut away. They are almost perpendicular (*Cicada*), or inclined postero-ventrally (*Aphrophora*); they are always conspicuous, occasionally very large (*Tettigonia*, *Aphrophora*).

2. *Spiracles between meso- and meta-thorax* lie concealed under the articulation of the hind wings, a little from the lateral margins on the ventral surface. They are smaller than (*Aphrophora*), of equal size with (*Cicada*), or almost larger than (*Fulgora*), the first pair. In, for example, *Fulgora* they are externally visible without preparation; in the *Stridulantia* they are best viewed in profile, as they are more or less covered by a posteriorly-directed flap arising from the posterior margin of the mesothorax; in the *Jassidæ* and *Cercopidæ* they are covered by a similar plate-shaped projection, and lie so completely hidden that they are not easy to discover.

b. ABDOMEN AND ITS SPIRACLES.

1. *Stridulantia*.—The tergite of the first segment of the abdomen is well developed, especially about the middle, but much shorter than the following segments; the sternite is also well chitinized, especially in the male more strongly and peculiarly. The second segment is solid throughout, without any trace of membrane between the tergite and the sternite; dorsally it is quite as long as the following segments. Each of the third to seventh segments is formed out of a sternite, which is far from reaching the lateral margin of the body, and of a tergite, which is extended to that lateral margin; between the lateral margins of the tergite and the sternite there is found a somewhat broad band, which, according to the explanation here adopted, is taken to be the *Pleuron*. This consists of two parts, *viz.*—externally, a conspicuous “chitinous” plate, which (except in *Cystosoma*, and partly in individuals of other forms with somewhat swollen abdomen) is separated from the tergite by a very narrow, thin, or somewhat thin marginal membrane; and, interiorly, by a (except in *Cystosoma*) distinct, narrow, thin membrane between the plate and the sternite.* The tergite of the eighth abdominal segment is coalesced with the pleural chitinous plate, whilst the sternite is entirely modified as a genital segment. (The following segments are not considered either in this or in the following families; it will only be stated that one finds in both sexes of

* The location of the spiracles in the third segment in, for example, *Tettigonia viridis* suggests the reckoning of the plate as part of the *Pleuron*, not as a ventral part of the tergite; the structure in *Cercopidæ* and *Jassidæ* suggests the consideration of the skin between the plate and the tergite, not as a suture, but as a part of the *Pleuron*.

Cicada, posterior to the eight spiracle-bearing abdominal segments, three distinct segments in addition to the "anal flap" (= telson), and that the ninth and tenth abdominal segments are, in the male, extremely modified; whilst in the female only the ninth is very strongly modified, the tenth being small and only slightly altered.)

The first pair of abdominal spiracles lies on the ventral side of the body close to the lateral margins in a depression at the base of the abdomen, surrounded by solid chitin (a part of the metasternum), which, particularly in the male, is very thick, and of a considerable breadth; they are transverse like the thoracic spiracles, but somewhat shorter than these. In most females they are generally not difficult to see when the abdomen is bent a little upwards, but in some females, and in most males, they are covered by the so-called "Opercula." The seven remaining pairs of spiracles are considerably smaller than the first pair, and of different structure; they are entirely open, with an oval or almost circular orifice, the Peritreme being a solid ring, which is also furnished with a great number of hairs directed towards the centre of the spiracle. The locking-mechanism lies a little behind the Peritreme. The first of them (thus the second pair of abdominal spiracles) is not altogether easy to discover. They lie like the first pair on the under side of the abdomen a little from the lateral margin close to the front margin of the second abdominal segment, but the chitin of this segment is inclined inwards (downwards seen from below) in such a manner that a transverse furrow arises, so that the spiracles actually lie near the bottom of the outer angle of this furrow, looking forwards and towards the insect's middle plane. In the female one can see them without preparation, but in the male they are often concealed by the "Opercula." Each of the third to eighth abdominal spiracles lies in the sternite itself a little behind its front margin, and close to the Pleuron.

2. *Cercopidæ*.—The first tergite extends right to the lateral margins, where it is moderately long,* but not strongly chitinized; towards the median line it shortens strongly, or even disappears as a solid formation; the sternite is short, well chitinized at the middle, and terminates far from the lateral margins. The second tergite is somewhat long, well chitinized, and extends right out to the side margins; the sternite is shorter medianly than the tergite, and is still shorter towards the lateral margins; it extends right out to this, and almost to the apical margin of the tergite

* In the original the word is "broad," but Dr. Hansen now accords with me that the words "broad," "narrow," "long," "short" should refer solely to the situation of the margin in question with regard to the longitudinal axis of the insect. This paper therefore is not a literal translation of the original in these respects, but represents Dr. Hansen's present views.—G. W. K.

(the sternites of these two segments are not visible without preparation, and the posterior coxæ should preferably be cut away, as they project forwards over them, and partly cover them). The third to eighth segments are formed essentially like those in the *Stridulantia*. Only the inner part of the Pleuron is always very distinctly developed, but not, however, particularly broad; it is now and then almost entirely membranous, but occasionally contains chitinous portions. In *Aphrophora alni* there are thus found in the membranous part of the Pleuron of the third to fifth segments two distinct narrow chitinous plates (an anterior and a posterior) in each segment.

The first pair of spiracles lies inside the lateral margins *on the lower side of the body* as far forward as possible towards the posterior margin of the metasternum, and on account of the shape of this plate, the projection of the coxa and the aperture of the spiracle being rather feebly defined, the spiracle is difficult to perceive. The second pair of spiracles lies *on the lateral margins* in a small chitinous piece, which projects a little forward and downward from the lateral angles of the second sternite of the abdomen, and, indeed, may appear to correspond with the large outer pleural chitin-plate in the following segments. The third to eighth pairs lie on the under side in the inner part of the Pleuron, and if this contains chitinized fragments it is located in the first of these. At least the second to eighth pairs of spiracles are cleft-shaped, fairly large.

3. *Jassidæ*.—The structures of this family agree largely with the foregoing. The form, the structure of which I have found easiest to study—and, if one likes, most typically developed—is the female of the very common *Tettigonia viridis*, L., for which reason it is the basis for the following observations.

The tergite of the first segment is not developed medianly, but more towards the side it appears as a not particularly long plate, which then contracts again, and terminates a little from the lateral margin; the sternite is very short, and does not extend quite out to the lateral margins, and is interrupted medianly. The second tergite is well developed, not particularly long, and extends almost to the side margins; the sternite is medianly nearly as long as the tergite, and its shortened lateral margins reach almost to the lateral margins of the body. The third to eighth segments are very similar to those in the *Cercopids*. On the fourth to seventh segments each Pleuron consists of a broad, strongly chitinized, exterior piece, and an inner band, which for its entire length contains a narrow chitinous plate; in the third and the eighth segments an inner plate of that kind is not developed.

(To be continued.)

NOTES AND OBSERVATIONS.

WHITE ANTS OR TERMITES.—Among the wonders of natural history, few can surpass the dependence of the life of these insects on that of their queen. This, at least, is generally believed in Bloemfontein, and I have reason to believe it true from what I have known myself. Many years ago (1879) a colony established itself close to the cathedral and to the house of Bishop Webb. Two Dutch Boers undertook the riddance, and had to go eleven feet deep before the queen was found—a large grub, with head like that of a bee. Till then the soldiers fought hard, and the hands of the Boers were covered with blood. After she was captured and taken away they became lethargic, and I had some difficulty in inducing one to attack me—but the mandibles cut like a pair of sharp scissors. I left South Africa shortly afterwards, but was glad to ascertain that no mischief whatever occurred afterwards. The creatures are called “hontkoppers” (wood-cutters), and I have seen a plant about the size of a slate-pencil cut to pieces by them. The white ants of Queensland, though about as mischievous, are, as far as I have seen them, much smaller and different. I was told by the Government ant-destroyer that he had found fifty-three queens in one nest! He had, of course, some difficulty in convincing other experts. In that colony another sort of ant, of a dull red, of exactly the same size, and so able to go up their tunnels, fights and destroys many.—(Rev.) GEORGE GLOVER; 55, Church Road, St. Leonard's-on-Sea.

TWO VARIETIES OF *LYCÆNA ICARUS*.—I have been fortunate enough to take two varieties of *Lycæna icarus* this year in Dorking, both of them on the same ground on the south side of Ranmore. On June 7th, while pill-boxing *Lycæna bellargus* among the wet grass in the evening, I came upon a male specimen of *L. icarus* quite normal on the upper side, but whose under side was as follows:—The marginal spots are very faint on both the fore and hind wings, and on each wing, in place of the usual thirteen or nine black spots with white circumscription, there is a single spot, the middle one only, all the rest of the wings being plain ashy-grey. It is rather a small specimen, but, luckily, in perfect condition. On June 14th, when engaged upon a similar pursuit, I took a gynandrous specimen. It possesses the male coloration on the left side, and the female on the right, the latter being of the blue form, though the black discoidal spot and the marginal spots are quite distinct. This, too, is in perfect condition.—F. A. OLDAKER; Parsonage House, Dorking, July 11th, 1902.

VARIETIES OF *AMPHIDASYS BETULARIA*.—I was much interested in Mr. Gervase Mathew's note (*ante*, p. 197) on the variety of *A. betularia* bred by him. Last year I took here a typical male, *in cop.* with a black female, resembling the variety described by Mr. Mathew. The latter I kept for ova, and she deposited a large number, the larvæ from which fed up well on plum. I unfortunately kept the pupæ too dry, and only thirteen moths were bred, but every one of them had black primaries dusted with white scales, some rather more than others; thorax and abdomen black, some examples having a few white scales on these also, front part of head white; secondaries pale. I may mention that I was walking in the road when I saw the male

parent, which was very conspicuous on a dark brick wall, but I had no idea the female was there also, until I came right up to it. This struck me as being an excellent instance of the usefulness of melanism for protective purposes in the neighbourhood of smoky London.—F. M. B. CARR; 46, Handen Road, Lee, S.E.

BRITISH TACHINIDÆ.—I should be very greatly obliged to any rearers of Lepidoptera, &c., who would save for me any Tachinidæ (parasitic two-winged flies) they happen to breed.—COLBRAN J. WAINWRIGHT; 2, Handsworth Wood Road, Handsworth, Staffs.

BRITISH ORTHOPTERA.—Mr. W. J. Lucas, of 28, Knight's Park, Kingston-on-Thames, who is preparing a Monograph on British Orthoptera, would be glad to receive local lists of the various species of earwigs, cockroaches, grasshoppers, locusts, and crickets. The lists should include every species, however common, and those from Scotland and Ireland would be especially welcome.

CAPTURES AND FIELD REPORTS.

ACIDALIA MARGINEPUNCTATA AB.—I see in the June number of 'The Entomologist' a figure of a curious aberration of *Acidalia marginepunctata* taken by Mr. J. P. Lawson at Clevedon. I took an exactly similar specimen in Sheppey, on the evening of Aug. 26th, 1899, with a large number of typical examples.—E. A. COCKAYNE; 6, Tapton House Road, Sheffield, June 23rd, 1902.

PYRAMEIS (VANESSA) CARDUI IN FIFESHIRE.—As the appearance of this butterfly in Scotland is irregular, it may be worthy of note that I took a fine specimen on Kemback Hill, four miles from here, on June 28th last. It was flying among firs, over heather adjoining cultivated land.—HENRY H. BROWN; Cupar-Fife.

SPHINX PINASTRI AT WINCHESTER.—On June 30th one of my pupils took a fine specimen of *S. pinastri* on a lamp-post in the suburbs of Winchester.—E. I. JOHNS; Winton House, Winchester.

IPHICLIDES (PAPILIO) PODALIRIUS IN LANCASHIRE.—A short time ago a scholar attending a country school in South Lancashire brought a live butterfly to the school and gave it to the master. The latter killed it, and asked a friend interested in the Lepidoptera to mount and name it. He said it was *Iphiclides podalirius*. The specimen was then shown to several collectors, some of whom strongly urged that inquiries should be made concerning its capture, &c., and the results published, as the affair was one which could not fail to be interesting to all engaged in the study of the Lepidoptera. The inquiries resulted as follows:—The fly was found entangled in a spider's web, in the forcing-house of Mr. Wm. Westwell, florist, Pennington Leigh. The following is a list of all the plants which have been in that house during the last year:—Small palms from Belgium, ditto from St. Albans, roses from France, spiræa from Holland, azaleas from Belgium, aralia (seeds) from France.—WM. BURTON; 39, Newton Road, Lowton, Newton-le-Willows, July 1st, 1902.

LARVÆ AND PUPE OF *PLUSIA MONETA* IN LONDON.—Between June 4th and 10th last I found fifteen larvæ and three pupæ of *Plusia moneta* on Delphinium in a garden at Herne Hill, Surrey, which place is within the four-mile radius of Charing Cross. All the larvæ have now spun up, except three which died; those which spun up on the under side of the leaves made cocoons of a semi-transparent white colour, which after about a week changed to a rich golden yellow, while those (the majority) which spun up on the wood of the breeding-house spun similar cocoons, but these, however, have not changed colour. Two imagos, up to the present time, have emerged.—RALEIGH S. SMALLMAN; Carlton House, Herne Hill, S.E., July 5th, 1902.

CYMATOPHORA OCTOGESIMA (OCULARIS) AND *PLUSIA MONETA* IN MIDDLESEX.—It may interest you to hear that I have taken, at Hampton Hill, two good specimens of *C. ocularis* at light this month, one on the 6th and the other on the 7th; also two specimens of *P. moneta* over flowers at dusk, one on the 12th and the other on the 13th of this month.—HERBERT S. JOB; The Vicarage, Hampton Hill, Middlesex, July 20th.

HYDRELIA UNCULA IN SURREY.—On the occasion of the Field Meeting of the South London Entomological and Natural History Society, held at Wisley on July 5th last, several specimens of *H. uncula* were captured. On the 14th of that month the species was still out, and I secured five specimens in fine condition. This species does not appear to have been previously observed in the county.—RICHARD SOUTH.

DITULA SEMIFASCIANA AND ANTITHESIA SALICELLA IN SURREY.—At Wisley, on July 14th, whilst collecting *Eupithecia tenuiata* from the lichen-covered stems of some large willows, I obtained one example of *D. semifasciana* and one of *A. salicella*; another specimen of the last-named species was missed. With regard to *D. semifasciana*, I may mention that I am indebted to Mr. A. Cant for a fine specimen that he reared from a larva found at Wimbledon in the spring.—RICHARD SOUTH.

HEDYA LARICIANA IN SURREY.—This species is sometimes fairly common among the larches on the Deepdene estate at Boxhill. I looked for it there on July 12th this year, but did not see it. At Wisley, however, on July 14th, I netted two specimens, and others were seen, but as I had the misfortune to break the top joint of my net-rod, I was unable to capture any more examples.—RICHARD SOUTH.

TORTRIX PICEANA AND SERICORIS BIFASCIANA IN THE ESHER DISTRICT.—As very close searching during the latter part of May and the beginning of June had failed to detect the larva of *T. piceana*, I had formed the opinion that the species would be scarce in the perfect state this year. On the contrary, however, it proved to be more abundant than I have ever known it to be before. A female specimen was beaten out during the afternoon of June 28th, and between six and seven o'clock in the evening of the same day several examples were seen flying high around pines, and two males and one female were captured. Between 3 and 4 p.m. on July 1st Tortrices were flying in great numbers over and around the pine trees; most of these were out of reach, but by four o'clock, when a heavy thunder-shower caused me to retreat, I had

secured six male specimens of *T. piceana*. Two males and one female were netted on July 3rd, and twelve specimens, including one female, were captured on July 7th. On the last-named date most of the examples taken were disturbed from heather under the pines in the afternoon, but scores were seen madly careering around the trees about 7 p.m. *S. bifasciana* was common on each of the dates mentioned, but the majority of the specimens netted were not in good condition after the thunderstorm.—RICHARD SOUTH; 96, Drakefield Road, Upper Tooting, S.W.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—*June 4th, 1902.*—The Rev. Canon Fowler, M.A., D.Sc., F.L.S., President, in the chair.—Mr. Stanley W. Kemp, of 80, Oxford Gardens, Notting Hill, W., was elected a Fellow of the Society.—Mr. H. W. Sheppard-Walwyn exhibited a recently-emerged male specimen of *Lampides batiscus* taken at Winchester in September, 1899, and two varieties of *Lycæna icarus*.—Mr. C. P. Pickett exhibited one asymmetrical male and two females of *Dilina tiliæ*, and a series of the same insect showing great variation of colour and marking, bred during May, 1902.—Mr. F. Merrifield showed enlarged photographs of larvæ of *Hygrochroa syringaria*. The larva is usually represented in an attitude in which it is practically never seen, crawling in an elongated form with its pair of long fleshy dorsal tubercles conspicuously projecting. But its habit is not to crawl, except in the dark, when it cannot be seen. All day it clings to the edge of a leaf or to a twig, in an attitude about as unlike a caterpillar good for a bird to eat as anything can well be, presenting a quadrangular form, something like a square hassock with tassels at the corners, and in one or two other places; the body is bent so as to form four right angles, the head and the anal segments forming two of the tassels, and the rest of the body forming a square from which the pair of long tubercles project at one corner, the other dorsal tubercles making other projections. Usually the parts of the body are so closely appressed that no daylight is visible between them, even when seen broadside against the light, which can rarely happen in nature. The resting attitude, unlike that of the *Selenias*, is practically the same in all stages of growth, and at all ages it is especially addicted to hanging down a few inches suspended by a silken thread, still preserving the hunched-up quadrangular form. Compared with the very dissimilar but equally misleading attitudes of other larvæ—such as the rigid *A. betularia* or the thorn-like *Selenia*—it seems an interesting illustration of the very different forms of disguise by which the result of escape from danger is attained. Mr. Merrifield also showed photographs of the dark-brown bronzy pupa of this species, in its hammock of open network of silk, very slight but exceedingly strong, from the bottom of which the larval skin is projected, not shortened and compressed, but pushed through the network, and hanging down like a long tail, so as apparently to attain the same end as in the larval stages, the disguising of its real nature; it looks very unlike an ordinary pupa.—Professor E. B. Poulton, F.R.S., exhibited a lantern-slide showing the perfect protec-

tive resemblance of *H. leucophæaria* to the oak-trunk upon which it rested.—Mr. A. Bacot exhibited hybrid larvæ resulting from a pairing between a male *Malacosoma neustria* and a female *M. castrensis*, also larvæ of *M. neustria*, and reputed larvæ of *M. franconica*, for comparison. He said that this year's brood of hybrid larvæ had separated into two batches, the "Forwards" being now nearly full-fed, and from one and a-half to two and a-half inches in length. The "Laggards" were not yet half grown, being half to three-quarters of an inch long, in this respect exactly following last year's brood resulting from a similar cross, in which case the "Forwards" produced only female specimens, while the "Laggards" produced only males.—Mr. H. J. Elwes, F.R.S., read a paper on "The Butterflies of Chile," and exhibited a selection of the specimens he had taken during December, January, and February, in that country. The endemic species of Satyridæ and Hesperidæ constituted about two-thirds of the whole butterfly fauna, Nymphalidæ and Lycænidæ being very few in numbers. Some butterflies of Holarctic types, such as *Colias vautieri*, had an extremely wide range, and extended, with little variation, right down to the Straits of Magellan. Among the most remarkable species which he showed was the unique Satyrid, *Argyrophorus argenteus*, the upper side of which is of a brilliant metallic silver colour, nothing similar existing in the whole family. This flies on open grassy hill-sides; whilst in the forests close by, a Hesperid, *Cyclopides puelmæ*, has its wings on the under side entirely of a metallic golden colour, this also being unique among the Hesperidæ. It seemed impossible to account for such remarkable cases of coloration by any theory of protective colouring. No natural frontier appeared to exist between Chile and Argentina, and nearly all the mountain species occurred on both sides of the political frontier, there being little difference between the alpine and the low country species.—Mr. S. L. Hinde read a paper, illustrated by lantern-slides, upon "The Protective Resemblance to Flowers borne by an African Homopterous Insect, *Flata nigroincta*, Walker." He said that "the cluster of insects grouped to resemble a flower-spike," which forms the frontispiece of Professor J. W. Gregory's 'Great Rift Valley,' had attracted some criticism, and that as he was familiar with the insect figured, and with its larva, in a wild state, it seemed desirable to publish the evidence. In the plate the insects are collected on the vertical stem, the green individuals uppermost considerably smaller than the red beneath, like the unopened green buds towards the top of a flowering spike as compared with the expanded blossoms below. The separate representations of the green and red forms, however, indicate no difference in size, and experience confirms this conclusion, so that the impression conveyed by the frontispiece plate is erroneous. After further noting that the uniform deep pink colour of the exposed parts of the insects figured was also incorrect, Mr. Hinde remarked that he had never seen the insects grouped according to their colours, but invariably mixed; that he had never found larvæ and imagines on the same stem, or even together on the same tree or bush; nor did the imagines affect vertical stems, but always those actually or approximately horizontal. When disturbed the imagines fly, and the larva hops, a short distance in any direction, but soon collect into groups again. The larvæ toward the end of a

growing branch are the smallest, and this arrangement might possibly reconcile Professor Gregory's account with the more recent observations.—H. ROWLAND-BROWN, *Hon. Sec.*

SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY. — *May 22nd, 1902.*—Mr. F. Noad Clark, President, in the chair. — Mr. Edwards exhibited fine specimens of *Morpho cypris* from South America, and several species of the genus *Caligo*.—Mr. F. M. B. Carr, a variable series of *Boarmia cinctaria* from the New Forest.—Mr. Barnett, *Hybernia marginaria* from West Wickham woods, one example approaching the form var. *fuscata*.—Mr. South, male and female *Liphyra brassolis*, with ova, preserved larva, larva-skins, a pupa, and a pupa-case, illustrating the curious life-history of this Queensland Lycænid, received from Mr. Dodd, and read notes.—Mr. B. W. Adkin, series of *Tæniocampa miniosa*, pale forms, and series of *T. incerta*, both from the New Forest. — Mr. Montgomery, bred *Pieris napi*, showing slight gynandromorphism in the markings. — Mr. Main, living larvæ of *Lithosia mesomella*. It was remarked that this larva has spatulate hairs.—Mr. Lucas read the report of the field-meeting held at Bookham on May 10th.

June 12th.—The President in the chair.—Mr. Ashdown exhibited living larvæ of *Attagenus pellis* feeding on wool.—Mr. Tonge, a *Noctua* he had recently captured, and which was afterwards recognized by Mr. South as a worn and probably hibernated example of *Hadena protea*.—Mr. Moore, a specimen of the rare *Pseudacraa trimenii* from the Transvaal Colony, which differed from the type in the large area of white on the lower wings.—Mr. Lucas, *Gryllotalpa vulgaris* (the mole-cricket) from Brockenhurst, and an example of the dipteran, *Meriania argentifera*, from the New Forest, and new to Britain.—Mr. R. Adkin gave a report of the Annual Congress of the South-Eastern Union of Scientific Societies, held at Canterbury on June 5th and 7th.—Mr. Hy. J. Turner read the report of the field-meeting held at Reigate on May 24th.—HY. J. TURNER (*Hon. Rep. Secretary*).

BIRMINGHAM ENTOMOLOGICAL SOCIETY.—*June 16th, 1902.*—Mr. R. C. Bradley in the chair.—Mr. Bradley showed *Syrphus barbifrons*, Fall., taken at Sutton on April 14th last. He went specially to find it, but it was scarce, and very difficult to distinguish from *Melangyna quadrimaculata*, Ver., amongst which it was flying. The latter species is common, the former species very rare and local, and possibly overlooked amongst the *quadrimaculata*. He obtained six males and five females; also, at the same time and place, he took one *S. arcticus*, Zett. (male). All were taken flying at swallow-bloom.—Mr. C. J. Wainwright, a boxful of Trypetidæ, including a large number taken in Wyre Forest on July 13th, 14th and 22nd last. On these three days he obtained no less than thirteen species of this one family. *Trypeta onotrophes*, Lw., in great abundance; *T. florescentiæ*, L., and *T. serratulæ*, L., not common, but a fair series of each from various thistles; *Urophora stylata*, F.; *Carphotricha guttularis*, Mg., and *C. pupillata*, Fall., in single ones; *Tephrites miliaria*, Schrk., common; *T. proboscidea*, Lw., a short series; *T. ruralis*, Lw. (two); *T. tessellata*, Lw., common; and a few of the commoner and more usual species.—COLBRAN J. WAINWRIGHT, *Hon. Sec.*

RECENT LITERATURE.

G. BREDDIN. "Die Hemipteren von Celebes." 1901. Abh. Naturf. Gesellsch. Halle, xxiv. pp. 1-217, 1 plate and 1 text-map [separately paged copy].

As everyone knows, Celebes is remarkable, as regards its Vertebrata at least, in belonging strictly neither to the Oriental nor to the Australian Region. Dr. Breddin has been so fortunate as to have had for examination the collections recently made by Fruhstorfer, Küken-thal, and the brothers Sarasin, and the result is an elaborate and carefully-prepared contribution to our knowledge of insular faunas, consisting of (1) a list, with localities, of all the certain and dubious Celebesian Rhynchota; (2) description of new forms, &c.; and (3) the inter-relations of the various Malayan faunas, the latter section being very fully discussed. Of course, as is natural where non-specialists have been the collectors, it is of the Cimicidæ, Lygæidæ (= Coreidæ), Reduviidæ, Cicadidæ, and Cercopidæ that we have the fullest information, 75 per cent. of the recorded forms being referable to these families.

The claims of 221 species are regarded as established, of which 143 are precinctive* so far as is known. Of the rest, a small number are widely distributed throughout the Oriental and Australian Regions; most, however, are confined to one or more of the neighbouring islands, principally Java, Sumatra, Borneo, and the Philippines. The conclusions reached are as follows:—

(1.) A land-bridge existed formerly, connecting East Java and South Celebes.

(2.) A similar bridge between the Philippines (Mindanao) and North Celebes.

(3.) Of these two, the former has been a little the more productive.

(4.) Borneo has not a single rhynchoton in common with Celebes (this is also the case with the mammals, land-birds, reptiles, amphibia, and land- and freshwater molluscs), which is not also found at the same time in Java, or in the Philippines, or in both of these latter. Celebes and Borneo have therefore never been in direct communication so as to render possible an interchange of species, the Macassar Straits forming an impassable boundary. The species common to Borneo and Celebes have become interchanged, either partly by a detour through Java, or partly through the Philippines, or probably by both ways at the same time.

(5.) Java has not been directly connected with Borneo, Sumatra having been the connecting link.

(6.) A bridge between Borneo and the Philippines existed formerly *via* Bangvey Island which, though nearer Borneo, shows some clear Philippine types.

I have noted only a single omission from the list of authentic Celebesian Rhynchota, *viz.* the widely distributed *Clerada apicicornis*, Signoret.

G. W. KIRKALDY.

* "Confined to the area under discussion." See D. Sharp, 1900, 'Fauna Hawaiianensis,' ii. p. 91.

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ON THE LARVA OF *LIPHYRA BRASSOLIS*, WESTW.

BY DR. T. A. CHAPMAN, F.E.S.

Two of the larvæ of *Liphyra brassolis*, sent to the Editor by Mr. Dodd (*ante*, p. 154), are apparently a full-grown one and another of very much smaller size. These two are so very different that, if they came from different places with different histories, one would never suspect their being at all related.

The smaller one is 6 mm. long and 2.3 mm. wide, very flat, reminding one very much of the larva of *Camponiscus luridiventris* (a common alder sawfly) in its general size and form, or, for that matter, of an ordinary *Lycæna* larva, if we make it first colourless, then nearly flat instead of raised along the dorsal line, and, thirdly, if we somewhat exaggerate the rounded lateral projections of the segmental margins. The segmental divisions as seen dorsally are twelve, of which the first and last, of course, are terminal. White and soft as this larva looks, the margins nevertheless have something of the appearance and structure of the full-grown larva, having a strong chitinous binding, divided into small cells. The prothorax has a slight angle on either side, allowing the front between the two angles to be a transverse straight line; beneath it is the head, placed quite centrally beneath it, but quite free from it and capable of much movement, including probably protrusion in front. The last segment, which is seen dorsally, is the ninth abdominal, and beneath this is the tenth, carrying the anal prolegs; the true segmental divisions are very plain on a ventral view of the larva. The prothoracic spiracle lies in the fold between the pro- and mesothorax, but the abdominal spiracles are each on about the middle of its own segment, placed dorsally, about half-way from the middle line to the margin. I do not detect anywhere any hairs or tubercles.

The nervous ganglia are very visible as reddish brown masses; a large one in prothorax: this represents the cephalic and œsophageal: the prothoracic proper towards posterior margin of segments; then one each to meso-thorax and eight following segments; the last and largest of these, though in sixth abdominal segment, appears to belong to seventh and following segments, which are without ganglia.

The prolegs are of much interest, not in themselves, but when we compare them with those of the adult larva; they are on a rather thick cylindrical base, and have the usual "macro" form of one row of crotchets, facing inwards, thirteen to seventeen in number; on the anal claspers they are much smaller and few in number (nine), and are similarly in one row. The true legs are short and thick, and terminate in very curved claws. The head is small, about 2.5 mm. in diameter; it has in front—on epicranium, clypeus, and labrum—a number of short stiff hairs (none seen elsewhere on larva), the largest about .08 mm. in length. The antennæ are rather longer than this, but happen to be telescoped,—the second joint is not in evidence,—about .06 mm. long and .04 mm. thick, with a terminal armament of bristles, amongst which the third joint is not clearly discriminated. The head itself is rather dark in colour from being well chitinised (the true legs and crotchets are the only other dark chitinised parts); beneath it are three circles, carrying jointed palpus-like appendages; the central one is the largest, and represents probably the labium, though at first it looks very like the spinneret, with the other two as labial palpi. The two lateral ones, however, are probably the maxillary palpi, especially as they appear to have another, ill-developed process. The jaws are long, and cross one another for some distance, and each seems to consist of a straight conical process, with only one sharp terminal point—a simple spike or dagger, and not the flat-toothed jaws usual in leaf-eating Lepidoptera.

The large larva is a very different object. At first sight nothing could be less like a lepidopterous larva. Looking down on its back, we have an approximately flat surface, oval in form, rather narrower in front than behind, with a margin smooth, regular, uniform, and of same texture, &c., all round, no trace of segmentation, &c. Let us turn it over: it now lies on its flat dorsal surface, the dimensions of which, by the way, are 23 mm. $\times$ 15 mm. It stands up above the surface about 5.6 mm., with a level, but not smooth top, but with smooth and sloping sides. The amount of the slope may be seen by the comparison of the top and bottom; the top (venter of larva) is 18 mm. by 7 mm., against the 23 $\times$ 15 just mentioned. The slope is nearly nil at the head end, and by so much the more therefore elsewhere. The dorsum and sides are brown, hard, and chitinous. The sloping sides show little indication of segmentation, but at the

margin of the open (and soft) ventral area present a series of dark markings, very slightly raised on rounded elevations, but so shaded as to look very much so. As it now lies on its back, it is not unlike a Melton-Mowbray pork-pie, of perhaps unusual oval shape, and sides more than usually sloping, the resemblance being heightened by the brown (chitinous) crust-colour of the sides, and the dark markings representing the more baked marginal sinuations with which such pies are often ornamented. The lid of the pie is the small flat ventral area of the larva, slightly wider anteriorly, and presenting the head, legs, prolegs, &c. This area is pale and white, and is the only portion where any movement can possibly occur, the rest being a solid chitinous cap. Constructed as it is to permit this soft area to be absolutely covered and hidden on the surface on which the larva rests, one is surprised at its widening out above this area, quite regularly till, at a sudden sharp margin, the sides meet the flat top. The brown marginal marks are apparently two to a segment, certainly so at the sides where they are largest, and where a faint depression along the sloping sides seems to mark each segmental division. To see this, however, requires close examination, and some might say a little imagination.

Turning the larva over again, to examine the back more carefully, we find the margin very sharp, and slightly browner than the terra-cotta centre. Laterally and posteriorly it is a little hollowed within the margin. Across the middle are three very distinct lines, darker in colour, and with the surface in front of them decidedly higher than that behind. They occupy the middle two-fourths of the surface, but do not invade the fourths on each side next the margin. In front and behind these the indication of the segmental divisions are very obscure. A faint indication of a dorsal ridge exists in front of these lines. There are also a number of dots that appear to be obsolete hair-points, arranged in some degree as a transverse line across each segment, but with outlines enough to make such a statement a little doubtful or even misleading. The two segments marked out by the dorsal lines are the fourth and fifth abdominal.

The character of the sharp margin of the dorsal area wants a little more definite description. In the first place, the out-sloping sides, for their top millimetre, cease to slope, but become vertical; then inside the sharp border the surface descends again steeply, so as to form a sharp raised border to the central area. In front the inner slope soon bends into the flat dorsal area; behind it does so more slowly, resulting in the hollow above noticed; round this portion there is, inside as well as outside, the sharp margin, a breadth of about 1 mm., differentiated by a slight line from the general dorsal surface. Seen microscopically, the whole surface consists of very minute raised dots, each carrying a fine point; on the marginal flange surrounding the dorsum

these are modified into an arrangement that has just the appearance of overlapping fish-scales. The spiracles are difficult to find, in fact I have failed to find the thoracic spiracle; the abdominal ones are precisely where they are in the small larva, viz. on the flat dorsum, half-way between the median line and the margin; they are very small, and differ little in appearance from the hair-dots noted above; they are minute holes, with no marginal structure; some trace of the true spiracles can be seen at a little depth within them, accompanied by a scale-like outer margin.

(To be continued.)

BUTTERFLY COLLECTING IN SOUTHERN ANDALUSIA IN THE SPRING OF 1902.

BY REV. HENRY CHARLES LIANG, M.D., F.E.S., M.R.C.S., &c.

AFTER a marvellous recovery from a severe illness, the result of mental strain, I was ordered to get away for rest and change of scene, and found just what I required in the shape of an English chaplaincy at Jerez de la Frontera, in Andalusia. Starting from England on March 11th, I arrived at Jerez, *via* Paris, Madrid, and Seville, on Saturday, March 15th. For a few days, as the guest of Mr. W. Buck, British Vice-Consul, at his beautiful house 'El Palacio,' I had every advantage in the suggestion of likely localities. My collecting began after church-time on Sunday, March 16th.

Jerez is an exceedingly picturesque Spanish town, full of Moorish and mediæval remains of great interest, and with quaint old streets of dazzlingly whitewashed houses, lined with fragrant orange trees. The vegetation in the gardens and squares is that of the subtropical character common to Southern Andalusia, the palm trees in the Plaza Mayor being taller than any I have seen in Europe. The country round is, in point of scenery, not very striking, being of an undulating character rather than hilly. The soil is heavy, and the roads are very dusty in dry weather, and very sticky and muddy after rain. Vineyards and corn-fields are the chief features of the scenery; these are intersected by roads flanked on either side with hedges of cactus or of aloes. The latter are often the only shelter from the burning sun, there being very few trees of any size in the district.

On my first day's collecting, principally along one of the afore-mentioned roads, between the cactus hedges, I found *Thais rumina* (common), *Pieris brassicæ*, *P. rapæ*, *Colias edusa*, *Thestor ballus*, *Pyrameis atalanta*, *P. cardui*, *P. megæra*, and *P. egeria*.

During the next two days, on the latter of which I visited a small estate known as "El Pinal," where is a small forest of

gigantic umbrella pines, I added the following to my list:—*Papilio podalirius* var. *feisthamelii*, *Euchloë belemia* and var. *glauce*, *E. euphenoides*, *E. cardamines* (one), *Gonepteryx cleopatra*, *Chrysophanus phlœas*, *Callophrys rubi*, *Lycæna astrarche*, *Vanessa polychloros*.

During the first few days the weather was very hot—abnormally so, even for Andalusia; but during the last ten days of the month it became very unsettled and cloudy, with rain at frequent intervals, and with but little sunshine; my collecting, however, continued whenever opportunities occurred, but by the end of March I had only added to the list *Euchloë belia* and *Pieris daphidice* on March 24th, and *Papilio machaon* and *Lycæna icarus* on March 25th.

The commonest butterflies during this month at Jerez were *Colias edusa* and *Pyrameis cardui*, which seem to be very abundant throughout Andalusia. *P. atalanta* was also common, and appeared to be in quite a fresh condition. Apparently this species emerges early in the spring; none of the specimens appeared to have hibernated. *Pieris brassicæ* was also common everywhere.

From April 1st to 4th I collected at Ronda. I felt well repaid for my journey thither, not only on account of the interesting old place, with its wonderful rocky gorges 530 ft. deep in the centre of the town, and its lofty surrounding mountains, but also by reason of my successful collecting. I found a lovely spot about two miles south of the town on the banks of the Guadalquivir, well wooded with olives, pines, and ilex, with a thick undergrowth of myrtles and bay trees, and abounding with white and purple cistus and other beautiful flowers, precipitous rocks rising on every side; this was my daily collecting ground, and here I found butterflies in abundance. *Thestor ballus* was to be seen in great numbers, accompanied by *Callophrys rubi*, which I have never seen in such profusion, except at Digne, in Provence. *Gonepteryx cleopatra* was in great numbers, and added greatly to the beauty of the scene, at least in my eyes. *Euchloë belia* and *E. belemia* were also very common, but the chief prize was *E. tagis*, which was to be seen here in profusion. It is easily distinguished when on the wing from the other two species, being of much more feeble flight, and easier of capture. *E. belemia*, though very common, is not easy to take; it has a way of evading the net by a dexterous doubling movement, of which *E. tagis* seems to be incapable. *E. belia* also is a strong-winged species, and requires a great deal of negotiation, but *E. tagis* is easily taken; I took fifty specimens in two days, and might have taken very many times that number if I had chosen to do so. This was my first acquaintance with the typical form of the species; hitherto I had only known it in its Provencal form *bellezina*, from which it is very distinct. It is very constant,

and is not capable of being confounded with *E. belia*; most English writers have been rather at fault in their description of this species (myself included), but a personal acquaintance with it will leave no room for mistaking the hazy, clouded appearance of the markings of the under side, and the generally slender character of the insect as compared with the other species. The original figure of Hübner exactly represents it.

I found here *Leptidia sinapis* for the first time in Spain; large and lightly marked. Other species taken here were *Papilio podalirius* var. *feisthamelii*, *P. machaon*, *Pieris daphidice*, *Gonepteryx rhamni*, *Euchloë euphenoides*, and *Lycæna bellargus*. *Thais rumina* was also common.

Vanessa polychloros was seen several times at Ronda, flying about ilex trees; I mention this particularly, as it is marked in both editions of Staudinger's Catalogue "¿And." The specimens taken appeared to be hybernated ones.

On my return to Jerez, on April 6th, I visited a range of low calcareous hills (Los Cruces) four miles to the south, overlooking the Atlantic, with views of Cadiz and Puerto S. Maria; there I found, in addition to the common species, *Lycæna lorquinii* (very sparingly, however) and *Melanargia ines* just beginning to appear. *Syrichthus sao* was also taken.

The only other species taken during the rest of my stay at Jerez were *Epinephele pasiphaë*, which became after a time pretty abundant; and, in one spot only, *Melitæa ætheria*, now ranked as a good species in Staudinger's Catalogue, 1901. Of this I took a good series in fine condition on April 18th.

On April 12th I saw a specimen, in good condition, of *Argynnis latonia*, in the grounds of 'El Palacio.'

Two days were spent in Cadiz, but the weather was very unfavourable, with only a few gleams of sunshine. Yet, whenever the sun did shine, there were plenty of butterflies to be seen, though only common ones—*P. atalanta*, *P. cardui*, *C. edusa*, *P. rapæ*, *P. brassicæ*, &c. Several times observed *P. cardui* flying, moth fashion, round the gas-lamps at night.

On April 22nd I went to Malaga, where the environs are very beautiful, and suggestive of the presence of butterflies. Here in the hills of the Mediterranean littoral I found a fair number of species. *Melanargia ines* and *Epinephele pasiphaë* were abundant; *E. ianira* was beginning to appear, also *Cænonympha pamphilus*. Of *Lycæna bætica* two specimens were observed. I also saw two or three specimens of the very small form of *Colias edusa* var. *pyrenaica*, Gr. Gr.; "fere duplo minor," Staudinger, 1901. Here also I took var. *helice*. *Epinephele ida* was also taken on April 29th. *Euchloë belemia* and *E. belia* and *Pyrameis cardui* and *atalanta* were common.

From Malaga I went up to Alhourhin el Grande, a village about ten miles northward; in the mountains here I hoped to

find *Zegris meridionalis*, but did not succeed in getting it. I found *Lycæna lorquini* in abundance in the higher regions, flying about thyme flowers in little groups. This is a good species, quite distinct from *L. minima*, and only occurs in Andalusia. I was in error in describing it in a former paper as occurring at Digne; I am now convinced that the Provencal specimens were only a small form of *L. sebrus*, from which this differs entirely.

From trying to do too much climbing after my recent illness, I unfortunately strained my knee-joint, and was unable to do as much collecting as I should have wished in this locality, which seems a very good one, but I took a few specimens of *Melitæa phœbe* var. *occitanica*, Stgr., on the higher ground, and, in addition, *Melanargia syllius* and *Pararge mæra* var. *adrasta*.

At Gibraltar, on May 2nd, I looked out for butterflies, and observed on the rock, and particularly at Europa Point, *Thais rumina* (one specimen), *Papilio machaon*, *C. edusa*, *P. atalanta*, *P. cardui*, *E. ida*, *E. ianira*, *P. megæra*, *Cænonympha pamphilus*, *Lycæna astrarche*, and *L. icarus*.

During one day's excursion in the woods near the waterfall at Algeciras, I found most of the common species, including *Euchloë belemia*, and took one specimen of *Lycæna melanops*.

The following is a list of the species taken in Andalusia from March 16th to May 3rd:—

- | | |
|---|---|
| 1 <i>Papilio podalirius</i> var. <i>feist-</i> | 22 <i>Melanargia syllius</i> . |
| 2 <i>P. machaon</i> . [hamelii. | 23 <i>M. ines</i> . |
| 3 <i>Thais rumina</i> . | 24 <i>Pararge megæra</i> . |
| 4 <i>Pieris brassicæ</i> . | 25 <i>P. mæra</i> var. <i>adrasta</i> . |
| 5 <i>P. rapæ</i> . | 26 <i>P. egeria</i> . |
| 6 <i>P. daphnide</i> . | 27 <i>Epinephele ianira</i> . |
| 7 <i>Euchloë belemia</i> and var. | 28 <i>E. ida</i> . |
| 8 <i>E. belia</i> . [glauce. | 29 <i>E. pasiphaë</i> . |
| 9 <i>E. tagis</i> . | 30 <i>Cænonympha pamphilus</i> . |
| 10 <i>E. cardamines</i> . | 31 <i>Callophrys rubi</i> . |
| 11 <i>E. euphenoides</i> . | 32 <i>Thestor ballus</i> . |
| 12 <i>Leptidia sinapis</i> . | 33 <i>Chrysophanus phloëas</i> . |
| 13 <i>Colias edusa</i> and var. <i>helice</i> . | 34 <i>Lampides boeticus</i> . |
| 14 <i>Gonepteryx rhamni</i> . | 35 <i>Lycæna astrarche</i> . |
| 15 <i>G. cleopatra</i> . | 36 <i>L. icarus</i> . |
| 16 <i>Pyrameis atalanta</i> . | 37 <i>L. bellargus</i> . |
| 17 <i>P. cardui</i> . | 38 <i>L. lorquini</i> . |
| 18 <i>Vanessa polychloros</i> . | 39 <i>L. melanops</i> . |
| 19 <i>Melitæa ætheria</i> . | 40 <i>Cyaniris argiolus</i> . |
| 20 <i>M. phœbe</i> var. <i>occitanica</i> . | 41 <i>Carcharodus alceæ</i> . |
| 21 <i>Argynnis latonia</i> . | 42 <i>Hesperia sao</i> . |

A CONTRIBUTION TO THE CLASSIFICATION OF THE COCCIDÆ.*

By T. D. A. COCKERELL.

MONOPHLEBINÆ.

Monophlebus, Leach.

Monophlebus, Leach, in Westwood, Arc. Ent. i. (1845), p. 22.
Type, *atripennis*.

Guerinia, Targ.-Tozz., in Signoret, Ann. Soc. Ent. France, 1875, p. 352. Type, *serratulæ*.

Drosicha, Walker, List Homop. Brit. Mus. Supp. (1858), p. 306. Type, *contrahens*.

Tessarobelus, Montrouzier, Ann. Soc. Linn. Lyon, xi. (1864), p. 246. Type, *guerinii*.

Llaveia, Signoret, Ann. Soc. Ent. France, 1875, p. 370.
Type, *axin*.

Ortonia, Signoret, Ann. Soc. Ent. France, 1875, p. 367 (not *Ortonia*, Wood, 1869). Type, *uhleri*.

Protortonia, Townsend, Jn. N. Y. Ent. Soc., 1898, p. 169.
Type, *primitivus*.

♀. Soft, somewhat elongated, more or less hairy, with powdery or cottony secretion. Legs and antennæ present; antennæ 11- (sometimes 9-) jointed; no long posterior ovisac. One species has 7-jointed antennæ.

♂. With fleshy caudal processes, arranged along the sides of the abdomen.

Species.—*M. dubius*, Fabr. (*fabricii*, Westw.), Sumatra; *M. atripennis*, Klug, Java; *M. leachi*, Westw., Malabar; *M. saundersi*, Westw., India; *M. burmeisteri*, Westw., India (?); *M. zeylanicus*, Green, Ceylon; *M. contrahens*, Signoret, China; *M. maskelli*, Ckll. (*burmeisteri*, Maskell, Tr. N. Z. Inst. xxix. p. 327), Japan; *M. corpulentus*, Kuwana, Japan.

M. illigeri, Westw., Tasmania; *M. crawfordi*, Maskell, Australia; *M. fuscus*, Maskell, Australia; *M. guerinii*, Montr., New Caledonia.

M. serratulæ, Fabr., Algeria; *M. fortis*, Ckll., Natal; *M. fulleri*, Ckll., Natal; *M. raddoni*, Westw., W. Africa.

M. axin, Llave, Mexico; *M. primitivus*, Townsend, Mexico; *M. mexicanorum*, Ckll., Mexico; *M. bowari*, Signoret, Guatemala; *M. uhleri*, Signoret, Ecuador; *M. championi*, Ckll., Panama; *M. cacti*, Linné, St. Eustatius Island, Lesser Antilles.

Unfortunately, many of the species are known only in one sex. The genus may be divided into a number of sections, thus:—

(1.) *Monophlebus*, Leach. Male with two caudal appendages. *M. atripennis*, *M. dubius*.

* For tables of subfamilies and genera, see 'Canadian Entomologist,' October, 1899.

(2.) *Tessarobelus*, Montr. Male with four caudal appendages. *M. guerinii*, *M. championi*.

(3.) *Llaveia*, Sign. Male with eight caudal appendages; female antennæ 11-jointed. *M. axin*, *M. saundersii*.

(4.) *Drosicha*, Walk. Male with ten caudal appendages; female antennæ 9-jointed. *M. contrahens*, *M. maskelli*, *M. leachii*, *M. burmeisteri*.

(5.) *Monophlebulus*, Ckll. Female with antennæ 7-jointed. *M. fuscus*.

Stigmatococcus, Hempel.

Stigmatococcus, Hempel, Rev. Mus. Paulista, iv. (1900), p. 399. Type, *asper*.

Perissopneumon, Newstead, Ent. Mo. Mag. 1900, p. 250. Type, *ferox*.

♀. Antennæ and legs present; antennæ 7- to 8-jointed; abdomen with numerous marginal spiracles. Found in nests of ants.

Species.—*S. asper*, Hempel, Brazil; *S. ferox*, Newstead, India.

Lophococcus, Cockerell.

Lophococcus, Ckll., 'Entomologist,' 1901, p. 227. Type, *mirabilis*.

♀. Fixed, with a strongly chitinous skin, and a long erect spine on the middle of the back, this spine originating as an elevated fold of the skin. No ovisac.

Species.—*L. mirabilis*, Ckll., Natal; on *Mimosa*.

Palæococcus, Cockerell.

Palæococcus, Ckll., Canad. Entom. 1894, p. 36. Type, *fuscipennis*.

Crypticerya, Ckll., Psyche Suppt., 1895, p. 15. Type, *rosæ*.

Leachia, Signoret, Ann. Soc. Ent. France, 1875, p. 359 (not *Leachia*, Risso). Type, *fuscipennis*.

♀. Soft, convex, without an ovisac; genital aperture large, considerably anterior to the end of the body; antennæ with 9 to 11 joints.

♂. Without caudal fleshy tassels.

Species.—*P. fuscipennis*, Burm., Europe; *P. hellenicus*, Genadius, Attica; *P. irregularis*, Germ., *P. pinnatus*, Germ., and *P. trivenosus*, Germ., fossil in Prussian amber.

P. australis, Maskell, Australia; *P. nudata*, Maskell, Australia.

P. ewarti, Newstead, W. Africa.

P. braziliensis, Walker, Buenos-Ayres; *P. hempeli*, Ckll., Brazil; *P. rosæ*, Riley-Howard, West Indies, &c.; *P. mexicanus*, Cockerell—Parrott, Mexico; *P. townsendi*, Ckll., New Mexico; *P. pluchææ*, Ckll., New Mexico; *P. simplex*, Scudder, fossil at Florissant, Colorado.

Section *Mimosicerya*, Ckll. Female antennæ 9-jointed; skin strongly chitinous at the sides. *P. hempeli*.

ON THE MORPHOLOGY AND CLASSIFICATION OF THE
AUCHENORRHYNCHOUS HOMOPTERA.

BY DR. H. J. HANSEN.

(Continued from p. 217.)

The first pair of spiracles lies, as in the Cercopidæ, *on the under side*, a little within the lateral margin close to the posterior margin of the metasternum; the second pair lies at the antero-exterior angle of the second segment near the lateral margins, so that they are looking laterally and upwards. The third and eighth pairs of spiracles lie in the outer solid Pleural Plates, the fourth to seventh pairs in the anterior part of the narrow Plates in the inner part of the Pleuron. All the spiracles are small.

In the Membracinæ the abdomen, as is well known, is often elevated very considerably, compressed, and strongly chitinized, therewith following certain peculiarities in structure, and in the situation of the spiracles. As an example, the structure in *Centrotus cornutus* is now described. In this the tergite of the first segment is moderately feeble, somewhat peculiarly formed, and terminates a good way from the lateral margin; the sternite is longer and more solid than in *Tettigonia*, and is not interrupted medianly. The second segment's tergite is tolerably feeble and short, ends a good way from the lateral margin, and at its ends a small pleural plate is found. On both segments there is thus a somewhat large space between the lateral margins of the tergite and the sternite. As regards the second segment, the third segment's pleural plate and the lateral part of its tergite form together a strong solidly chitinized wedge, which fills up the space mentioned. On the third segment's tergite one sees at the anterior margin a deep transverse furrow, and in front of this an arched part, which one would readily take for the posterior part of the tergite of the second segment—which it is not—as this is situated in advance thereof as a more feeble short stripe. On the third to eighth segments the inner part of the Pleuron is only a somewhat narrow membrane, while its chitinized outer plate is very considerable. The first and second pairs of spiracles are consequent upon the peculiar structure and altered bodily form of the first segment, *transferred considerably above the lateral margins*, and look backwards; the second pair lie in the tiny pleural plate a little higher up than the first pair; the third to eighth pairs are transferred to the intero-anterior angles of the pleural plate.

In *Membracis tectigera* somewhat comparable circumstances are found, but here the pleural plates of the third to eighth segments are separated from the tergite and sternite only by a

feeble suture without proper membrane. *Æthalion reticulatum* accords, discounted by tolerably small peculiarities, essentially with *Tettigonia* in the structure of the first two segments, and in the situation of their spiracles; on the other hand, they agree essentially with *Centrotus* in the structure of the pleura of the third to eighth segments, and in the situation of their spiracles. *Ledra aurita*, on the contrary, agrees in all essentials with *Tettigonia*.

4. *Fulgoridæ*.—The peculiar structural characters of this family are simplest and easiest to study in one of the large forms—for example, a species of the subgenus *Fulgora*—and a species of this genus is for that reason the basis of the following observations.

The tergite of the first segment, which is medianly indistinct and short, is laterally longer and well chitinized, and terminates a little from the lateral margin of the abdomen, which is membranous, externally *limited and coalesced with a posterior and somewhat outwardly directed lateral part of the metanotum*; the sternite is everywhere very short, but well chitinized, and extends right out to the lateral margins. The tergite of the second segment is broad medianly, and shortens considerably laterally up to the vanishing point, before it reaches right out to the lateral margins; the sternite is everywhere tolerably short, not very strongly chitinized, and does not reach right out to the segment's lateral margins, which are entirely membranous, but very short, as the pleura of the third segment and the outer part of its tergite extend forward as a—taken together—considerable oblique triangular formation on the lateral parts of the abdomen. The sternites of the first and second segments, together with a large part of that of the third segment, are covered, as seen from below, by the posterior coxæ and trochanters. The dorsal tergites of the third to eighth segments reach, as usual, out to the lateral margins, whereas their sternites (of which the eighth is modified for the service of the genitalia) extend *somewhat farther out laterally* than in the above families. The pleura are broad, and consist of a *lower, well developed, but, however, not especially broad (in Fulgora ventral) chitinous plate, and a usually broader, upper, lateral part, which may be noted as typically membranous*, appears as such in many forms (for example, *Megamelus*, *Issus*), but in *Fulgora* presents a somewhat irregularly formed, strongly chitinized portion near its lower margin.

The first pair of abdominal spiracles lies on the ventral part of the segment in front, and partly exterior to the end parts of the first segment's tergite, and behind and within the backwardly directed lateral parts of the metanotum; this is in *Fulgora* considerable and transverse. *The second pair of spiracles also lies ventrally at a very considerable distance from the lateral margins behind the lateral part of the first tergite, thus more approaching the*

insect's middle plane than the first pair does; it is a little larger than the latter, and also transverse. *The third to eighth pairs lie at the side of the insect* in the membranous part of the pleuron close to their solid chitinization; they consist of oblique, apically downwards inclining fissures, and are all large, the first three pairs the biggest, and about the size of the dorsally-situated second pair.*

Deviations from this dorsal structure in the other Fulgoridæ examined by me appear to be tolerably feeble, and of subordinate significance. Some more essential examples may be mentioned. In *Aræopus crassicornis* the first and second pairs of spiracles are proportionately importantly smaller, and (as it seems) shorter and broader than in *Fulgora*; their situations with regard to the outer part of the metanotum, and with regard to one another, are the same; the third to eighth pairs lie in the solid part of the pleuron, which here, on account of the breadth of the sternites, looks laterally just like the upper membranous part. In *Eurybrachys* sp. the third to eighth pleura are very broad, but a chitinized lower part is not particularly developed—at least the pleura are everywhere membranous without special differentiation in the quality of the skin. In *Tettigometra costulata* the second tergite has nearest to the lateral margins a very considerable length, and its ovate spiracle lies in the tergite itself; but the relative situations of this and the first pair are as in *Fulgora*; the spiracles of the third to seventh pairs lie a little inwardly in the solid part (of the pleura), which turns obliquely outwards and downwards; on the eighth segment the solid spiraculiferous pleural part is coalesced with the sternite. The peculiar Flatidæ, with elevated compressed abdomen, accord essentially with the medium-sized Fulgoridæ.

A *résumé* of this well-marked family may be stated as follows: the dorsal situation of the first and second pairs of spiracles, the location of the first pair in the angle of the metanotum, the looking outwards essentially or totally of the third to eighth pairs of spiracles situated in the pleura, which are either in great part or totally lateral, and consist of an upper essentially or quite membranous part, and a lower portion, which is mostly strongly chitinized.

* Judging from observations on these lateral spiracles in *Calyptoproctus*, their structure is very peculiar, but I have reason to believe that their formation is not uniform in the different forms of Fulgoridæ; so that I entirely omit a description here, as I am not able to make it complete.

(To be continued.)

ON SOME NEW GENERA AND SPECIES OF HYMENOPTERA (ICHNEUMONIDÆ, CHRYSIDIDÆ, FOSSORES, AND APIDÆ).

By P. CAMERON.

(Continued from p. 208.)

SCOLIIDÆ.

TIPHIA SPINOSA, sp. n.

Nigra, alis flavo-hyalinis, nervis fuscis, stigmatibus nigro; metanotum striolato; petiolo subtus spinoso; mandibulis palpisque nigris. ♂. Long. 12 mm.

Hab. Khasia Hills (coll. Rothney).

Antennæ short, stout; the scape closely and distinctly punctured, sparsely covered with fuscous hair; the flagellum covered with a pale microscopic down. Front closely, strongly, and uniformly punctured; the vertex has the punctures more irregularly distributed, larger and more widely separated; both are thickly covered with white hair. Clypeus closely punctured, and thickly covered with white hair; in the middle is a slight incision. Mandibles black, shining; the base closely punctured, thickly covered with silvery hair; the palpi dark testaceous. Pronotum closely and strongly punctured, its apex smooth; behind the basal keel obscurely longitudinally striated. Mesonotum with large deep moderately widely separated punctures; the scutellums are similarly punctured. On the median segment are three keels; the central is straight, the outer more irregular; the space between them is strongly shagreened, and irregularly transversely striated; the space outside them is irregularly reticulated and striated; on the apex are three short stout keels, the inner of which does not reach to the transverse apical keel; the outer converge at the base. The apex is coarsely shagreened, irregularly reticulated, and round the edges striated; the keel bounding the top is stouter than usual; on the sides near the middle, extending half on to the notum and half on to the pleuræ, is a large deep ovate depression with raised sides; inside it is shagreened. Propleuræ closely striated; the top punctured, the apex smooth; mesopleuræ strongly but not closely punctured; metapleuræ strongly striated; the base largely and deeply excavated on the upper part, the lower part strongly shagreened. Mesosternum rather strongly but not closely punctured, thickly covered with a pale pubescence, and with long fuscous hair; the middle has a broad rounded furrow. Legs thickly covered with silvery pubescence; the spines rufous. The radius has an oblique slope at the base; the second transverse cubital nervure has a rounded outwardly curved slope; the first recurrent nervure is rounded outwardly at the top, and is received almost in the middle of the nervure. The petiole is strongly but not closely punctured at the apex; the base of the second segment has a narrow strongly and closely striated depression; the other segments are punctured, the punctures becoming stronger and closer towards the apex; the apical segments are thickly covered with pale pubescence. The base of the first ventral segment bears a stout

curved, somewhat triangular, spine; the apical part of the segment is strongly shagreened; on the sides are two or three large irregular foveæ; the apex is furrowed and stoutly longitudinally striated. The pygidium is coarsely punctured; the epipygium is coarsely punctured, with a smooth shining band in the middle; the ventral segments are fringed with bright golden hair.

A species easily known by the tooth on the base of the petiole, by the stoutly transversely striated middle of metanotum, and by the stoutly striated base of the second abdominal segment.

TIPHIA CURVINERVIS, sp. nov.

Long. 14 mm. ♀.

Hab. Khasia Hills (coll. Rothney).

Agrees closely in form and coloration with *T. fulvinervis*, but is smaller; may readily be separated from it by the second transverse cubital nervure being roundly curved at the top, the whole nervure being of the shape of a reaping-hook.

Scapæ of antennæ thickly covered with long pale fulvous hair; the flagellum with a pale pile, its last joints rufous. Front and vertex strongly and deeply but not very closely punctured, and sparsely covered with long pale fulvous hair; the keel over the antennæ is large, but not stout, and is bluntly conical. Face and clypeus closely and somewhat strongly punctured; the apex and the middle of the clypeus smooth. Mandibles rufous in the middle, fringed below with long pale golden hair. The basal slope of the pronotum is closely and distinctly punctured; the basal half of the upper part bears large deep punctures; the apical is smooth; the whole is thickly covered with long white hair. Mesonotum bearing large deep scattered punctures, the sides impunctate in the middle. Scutellum with some large deep punctures on the apex; the post-scutellum similarly punctured at the base. Median segment coarsely shagreened, more strongly between the keels; of these there are three; the outer are curved outwardly at the base; the inner reaches near to the apex; the oblique slope is strongly shagreened, is thickly covered with a short white pile, and is irregularly punctured and striated round the edges. Propleuræ longitudinally striated; above the striæ are thinner, more irregular, and are intermixed with punctures. Mesopleuræ rugosely punctured, thickly covered with white pubescence. Metapleuræ closely striated, except at the base, which is broadly shagreened. Basal half of the mesonotum strongly punctured; the apical smooth; the apical area narrowed at the base, the narrowed part deeply furrowed; there is a triangular depression in the middle at the base; the sides have a few punctures. Legs thickly covered with glistening silvery hairs; the spines are rufous. Wings fulvo-hyaline, the hinder pair paler at the apex and behind; the nervures and stigma are fulvous. The base of the radius is straight, and has an oblique slope; the upper half of the second transverse cubital nervure has a round outward curve; the lower half is almost straight, oblique; the first transverse cubital nervure has a rounded outward curve at the top; the second has an oblique slope, and is received near the base of the apical third.

Abdomen shining, sparsely punctured; the apical segments thickly covered with long white hair; the basal half of the pygidium is strongly punctured, and is thickly covered with long pale fulvous hair; the apex is smooth, rufous, and is keeled down the middle; the epipygium is closely and finely punctured.

TIPHIA BICARINATA, sp. nov.

Nigra, punctata, longe hirsuta; alis fusco-violaceis; metanoto bicarinato. ♂. Long. 16 mm.

Hab. Japan (George Lewis).

This species is larger than any of the recorded Japanese species, from which it differs (as it does also from the Indian) in having only two keels on the median segment.

Scape of the antennæ shining, bearing large deep punctures and long pale fulvous hairs; the basal three joints of the flagellum shining, thickly covered with glistening fulvous hair; the rest of the flagellum opaque, covered with a dull pale down. Front and vertex closely and strongly punctured; there is a smooth space on the outer side of the hinder ocelli, which is continued across behind them by a space having only a few small punctures; the part immediately behind the ocelli is strongly punctured. Front thickly covered with long, the vertex with shorter, fuscous hair; in front of the ocelli there is a smooth space—somewhat dagger-shaped in form—broad at the base, narrowed and sharply pointed at the apex. Clypeus smooth and shining in the middle; the base and sides shagreened. Mandibles broadly piceous in the middle; the lower side fringed with long pale golden hair at the base. The pronotum on the perpendicular base closely punctured, except on the lower side in the middle; the upper part coarsely punctured, except a broad somewhat curved space at the base. The middle of the mesonotum is slightly depressed, closely and coarsely punctured, the sides are bordered by a row of large deep punctures, closely united together, followed inwardly by a row of larger ones, fewer in number, and more widely separated; inside of these again is a smooth space, with a large puncture near its centre. Scutellum closely punctured at base and apex, the middle smooth. Median segment shagreened, opaque, finely longitudinally aciculated at the apex; in the middle are two stout keels, which hardly converge towards the centre. The base of the propleuræ bears moderately large punctures, closely united together at the extreme base, widely separated and scattered over the rest; the lower half is closely obliquely striated, the striæ somewhat coarser towards the apex; the whole shining. Mesopleuræ strongly punctured, opaque, thickly covered with long white hair. In the middle of the metapleuræ is a shallow curved furrow; the upper part at the base strongly obliquely striated; the lower smooth, very finely striated; the apex is also finely striated. Legs black, the projection on the apices of the femora piceous; the coxæ, trochanters, and femora smooth, sparsely covered with soft white hair; the fore tibiae slightly, the four posterior very thickly, covered with white hair; coarsely punctured on the outer, smooth on the inner side; the outer row of broad spines pale and fulvous; the calcaria testaceous. The petiole shining, smooth, covered with long fuscous hair, more sparsely

towards the apex; the second and third segments sparsely and shallowly punctured: the fourth much more coarsely and closely; the fifth rugosely punctured; the pygidium coarsely longitudinally striated, intermixed with some coarse punctures; its apex finely, closely, longitudinally striated. The basal ventral segment punctured at the base; the second coarsely, the others more finely and closely punctured; the second smooth; the third and fourth aciculated at the base; the last rugosely punctured. Wings fusco-hyaline; the nervures and stigma deep black.

POMPILIDÆ.

SALIUS HIMALAYENSIS, sp. nov.

Niger, capite thoraceque dense aureo pilosis; pleuris brunneis; apice abdominis late rufis; pedibus rufis, coxis trochanteribusque brunneis; alis flavo-hyalinis. ♀. Long. 15 mm.

Hab. Khasia (coll. Rothney).

A species closely related to *S. flavus*. The differences between the two may be best shown in synoptical form:—

Second cubital cellule at the top distinctly shorter than the first; the pleuræ and median segment black; the femora broadly black at the base		<i>flavus</i> .
Second cubital cellule equal in length to the first; the pleuræ and median segment brownish; the femora without black		<i>himalayensis</i> .

Antennæ pale fulvous, the scape darker in tint. Head dark ferruginous; the vertex, front, and face densely covered with golden pubescence, the face bearing also some long rufous hairs. The apex of the clypeus is broadly rounded, closely punctured, except on the extreme apex. Mandibles dark ferruginous, the teeth black, the extreme base covered with depressed golden pubescence. The greater part of the prothorax and the mesonotum densely covered with depressed golden pile; scutellum minutely punctured, and covered with rufous hair. Median segment irregularly transversely striated, sparsely covered with black hair; the base and apex black; the middle with a wide shallow furrow. The propleuræ are of a brighter colour than the meso-; the metapleuræ darker; the mesopleural furrow is narrow; the metapleuræ irregularly obliquely striated. Legs ferruginous; the coxæ blackish behind; the tarsi are paler; the hinder femora darker. Wings yellowish hyaline; the apex slightly infuscated; the first and second cubital cellules are equal in length on the top. Abdomen black, shining; the apical two segments ferruginous, and thickly covered with long rufous hairs.

POMPILUS SETABIS, sp. nov.

Black, the under side of the scape white, of the basal joints of the flagellum brown; the apex of the median segment densely covered with white pubescence; wings hyaline, the apex smoky; the third cubital cellule petiolated. ♂. Long. 8 mm.

Hab. Borneo.

Antennæ stout; the apical joints of the flagellum roundly dilated; the basal three joints brownish; the scape for the greater part white

beneath. Head densely covered with silvery pubescence, thickest on the front and clypeus. Eyes long, slightly converging above; the ocelli are in a curve; the hinder are separated from each other by a slightly greater distance than they are from the eyes. Clypeus at the apex transverse in the middle; the labrum large, the palpi black. Thorax densely pruinose; the apical slope of the median segment is densely covered with woolly hair, silvery white in colour. Legs densely pruinose; the tibial and tarsal spines long and black; the calcaria white; the longer of the hinder pair is two-thirds of the length of the metatarsus. Wings hyaline; the apex of both wings infuscated; the radial cellule short, wide; the third cubital cellule is petiolated; below it is as long as the second; the first transverse cubital nervure is broadly and roundly curved; the first recurrent nervure is received close to the transverse cubital; the second shortly beyond the middle of the cellule; the accessory nervure in the hind wing is received behind the cubital. Abdomen sessile; the basal segments densely covered with silvery pubescence; the apical segment bluntly pointed.

(To be continued.)

NOTES AND OBSERVATIONS.

ARE COCOONS WATERPROOF?—The question is suggested by my experience of the disastrous rain-storm at Ipswich on July 1st. I had a chrysalis of *Odonestis potatoria* in the cocoon on a stem in a tall glass jar, which stood in a sheltered position near a wall. To my surprise next morning I found the jar was filled with water to the depth of five inches (a fact which indicates the greatness of the deluge), and I concluded the chrysalis was drowned, and threw it aside. Two days later, when it was dry, curiosity caused me to open the cocoon, and I found the pupa alive and kicking! Considering that it must have been nearly twenty hours under water, I thought the incident worthy of record, and should be interested to hear of similar experiences. CLAUDE A. PYETT; 28, Waterloo Road, Ipswich.

ICHNEUMON IN *ZYGÆNA TRIFOLII*.—In July, 1901 (when in search of *Aporia crategi*), I came across a fresh locality for *Z. trifolii*, and the examples appeared to be of a more blotched character than those I usually get. This year I went to the spot in June in order to collect a number of cocoons, and to my surprise I found that there were two distinct sizes, one about one-third the size of the other. In about a couple of hours I collected 400 cocoons, and after I reached home I separated the two sizes, and found there were 275 small ones and 125 large ones. Several small larvæ (typical *trifolii*) spun up while in my possession, and were amongst the 275. I thought there must be two species, and anxiously waited for their emergence. Alas! I was disappointed, for the large cocoons produced very normal *Z. trifolii*, and the smaller ones were all ichneumonoid, with three exceptions, which produced very dwarfed *trifolii*. The percentage of ichneumonoid cocoons (68.75 per cent.) seems exceptionally great, for in another place I

found the cocoons of *Z. filipendulæ* very plentifully, and, having collected five hundred in a very short time (getting as many as six on one stem of grass), only two ichneumon flies emerged, or a percentage of '04, but unfortunately vars. were represented by a percentage of '000. Should anyone visiting Margate find that either of these species of *Zygæna* is a pest, he may blame me for having introduced them in any numbers. I shall be glad to show anybody interested in ichneumon flies the two sizes of cocoons.—J. P. BARRETT; St. John's Villas, Margate.

PIERIS NAPI TWELVE MONTHS IN PUPA.—During June last several specimens of *Pieris napi* emerged from chrysalids of June, 1901. For some reason they did not emerge as second brood last year, and their colouring is of the spring type.—C. A. SLADEN; The Rectory, Alton Barnes, Pewsey, Wilts, August 6th, 1902.

PLUSIA MONETA: A FEW NOTES AND QUERIES.—The above species was first discovered, I believe, in this country in 1890; odd specimens were captured or bred every year in and about the county of Kent by different collectors and duly recorded, the insect being looked upon as a great prize. In 1900 a good number of the larvæ were discovered and successfully bred; in 1901 a larger quantity of the larvæ were found and more captures recorded, but this season, I think, has eclipsed all previous records; it has appeared all over London, practically wherever its food-plants (*Aconitum* and *Delphinium*) are cultivated; and when one reviews its career from the time it first appeared, we must admit it has apparently firmly established itself, at least in Kent; but will it last? I should never be surprised to hear of its sudden disappearance; therefore, on behalf of all concerned, I think it would be most interesting if some of our brother enthusiasts, older and more experienced than I, would give us their valuable opinions *re* this species through the medium of this Journal. In the meantime, I would strongly advise those collectors who have not yet got this handsome insect to add it to their collections while it is—as a friend of mine rightly or wrongly puts it—so awfully “common”!—A. J. LAWRENCE; 65, Malyon Road, Ladywell, S.E., Aug. 16th, 1902.

GYNANDROUS ARGYNNIS PAPHIA.—Whilst staying at Brockenhurst, in the New Forest, last month, I was fortunate enough to capture, on July 28th, a very good specimen of *A. paphia* (hermaphrodite). It was at rest on bramble-blossom, and was quite easily seen, due to the distinct shades of colour. The right side is male, and the left female; each half of head, thorax, and body also corresponds to the sex.—HERBERT CHARLES; Woodend, Torrington Park, North Finchley, Aug. 15, 1902.

UNUSUAL PAIRING OF BUTTERFLIES.—I think the following is worth recording. On July 15th last I found a male *Eurytela hiarbas* in cop. with a female *Neptis agatha*. I had not a net with me, but managed to secure both insects with my hand. I kept the female *N. agatha* alive in the hope of getting some ova, but unfortunately she would not lay in confinement. Is it not very unusual for two such distinct species to pair? I shall be pleased to know if any other collector in Africa has ever found these two insects *in cop.* I may mention that

N. agatha has been unusually abundant here this season, and *E. hiarbas* not nearly so common as during the two previous seasons. — G. F. LEIGH; Heathfield, Sydenham Road, Durban, Natal, July 26th, 1902.

CAPTURES AND FIELD REPORTS.

LYCÆNA MINIMA VAR. ALSOIDES IN HAMPSHIRE. — Mr. B. Piffard reports the capture of this large form of *L. minima* on the coast near Lymington, and he has kindly presented a pair to the National Collection of British Lepidoptera. It should be mentioned that Mr. Piffard states that there is no chalk or limestone in the district where he obtained the specimens.

APORIA CRATÆGI IN KENT.—This butterfly, I am pleased to record, still survives in my neighbourhood. Early in July I caught a fresh male on a small patch of clover, which proved to be the "home" of a batch of the insect, for on subsequent days I very easily took nineteen more, making exactly a score. I also saw about another score specimens on the "rampage," but at such time *A. cratægi* is not easy to capture, for the wind takes it along at a terrific pace, and I can only account for six examples captured away from the "home"; the greatest distance between specimens captured was about ten miles. I am inclined to think the insect is domiciled in the fruit orchards. I failed to get eggs, though one female, taken *in cop.*, lived over a fortnight under artificial conditions. I kept two females and a male together with the proper food-plants and fed them regularly, but to no purpose.—J. P. BARRETT; 3, St. John's Villas, Margate.

PIERIDÆ IN LONDON.—In the daily papers one occasionally sees letters from astonished correspondents recording the appearance of a butterfly in London. It is doubtful whether these occurrences are quite as rare as is generally supposed. It may, however, be worth mentioning that on June 19th, at about 4.30 p.m., I saw a specimen of *Pieris brassicae* in Northumberland Avenue. There was at the time a strong breeze coming off the river, and, after vainly struggling towards a plane tree, the butterfly got blown towards Trafalgar Square. The flowers in the window-boxes at the Métropole had been changed that morning, and the specimen may have been accidentally imported with them. I saw another specimen of *P. brassicae* in Northumberland Avenue on June 24th. Earlier in the season I saw, but was not near enough to identify accurately, a *Pieris* in St. James's Park.—D. P. TURNER; 2, Shalston Villas, Surbiton, July, 1902.

PLUSIA MONETA IN HAMPSHIRE.—Four larvæ of *P. moneta* were taken here during the last week in May from plants of *Delphinium*. The moths successfully emerged between June 28th and July 9th. It would be interesting to learn in what form this species passes the winter. It seems reasonable to suppose that the eggs from which these larvæ were produced were laid last July, since the patch of *Delphinium* was that over which a specimen of the perfect insect was

then taken. But in the autumn the plants die down to the roots, and in the spring the whole of the surface of the ground was disturbed several times. It seems difficult, therefore, to imagine how either eggs or hibernated larvæ could survive.—G. W. RUSSELL; Portchester, Hants, July 26th, 1902.

PLUSIA MONETA IN WILTSHIRE.—I have to report the capture of *Charocampa porcellus* and *P. moneta* at honeysuckle on the evening of July 17th last.—C. A. SLADEN; The Rectory, Alton Barnes, Pewsey, Wilts.

PLUSIA MONETA AT WINCHMORE HILL.—On the evening of August 6th a fine specimen of *P. moneta* flew into the room where there was an incandescent light burning.—B. HICKLIN; Cranford, Winchmore Hill.

PLUSIA MONETA IN SURREY.—On July 14th a specimen of this moth was captured flying over *Delphinium* in a garden at Sutton, and forwarded to me. From that date down to the time of writing (August 1st) twelve more specimens have been taken in the same garden, the later captures showing signs of being worn. The species has evidently "come to stay," and there is perhaps no necessity for further detailed records. Nevertheless, I venture to forward this record, in order that the spread of the species throughout the counties may be noted for future reference. I may add that two of the specimens have laid eggs, and that an attempt will be made to feed up the larvæ when they hatch.—R. MELDOLA; 6, Brunswick Square, W.C., Aug. 1st, 1902.

COLIAS EDUSA IN ESSEX, 1902.—On August 10th, a very hot day, three *C. edusa* were seen, and one of these was captured.—RICHARD J. FITCH; Brick House, Maldon, Essex.

LASIOCAMPA QUERCIFOLIA IN LONDON.—On July 29th I took a fine female specimen of this moth, resting on a window-frame of a restaurant in the Euston Road, N.W., about 10.45 p.m. On arriving home, a few minutes later, I found it had already deposited about a dozen eggs. As the moth was so fresh I killed it, thinking that the ova would be infertile. To my surprise, on August 12th I found nine larvæ had hatched, and these are feeding all right up to the present.—H. PERKS; 43, Charlotte Street, Portland Place, W., Aug. 17th, 1902.

RHODOPHÆA FORMOSA AND *ONCOCERA AHENELLA* IN HERTS.—Among some Lepidoptera sent to me for identification by Mr. Philip J. Barraud, of Bushey Heath, were three specimens of *R. formosa* and one male example of *O. ahenella*.—RICHARD SOUTH.

CHROSIS BIFASCIANA IN SURREY.—So far as I am aware, Reigate and Haslemere are the only localities in Surrey from which this species has previously been recorded. On July 12th last, whilst netting a few specimens of *Batodes angustiorana* at Box Hill, I secured one example of *C. bifasciana (audouinana)*.—RICHARD SOUTH; 96, Drakefield Road, Upper Tooting, S.W.

PIONEA (EBULEA) STACHYDALIS IN SURREY.—I took two examples of this species in the Esher district on July 18th last. They were disturbed from herbage among which were a good many plants of *Stachys sylvatica*.—RICHARD SOUTH.

THE BUTTERFLIES OF THE WITHERSLACK DISTRICT.—In one of the Lancaster local papers there appeared recently a short article stating that nearly all the British butterflies occurred at or in the vicinity of Witherslack, Westmoreland. A list of the different species which do occur in that district will no doubt be interesting, and serve as a guide for intending entomological visitors. No less than thirty-nine species occur or have been taken in the neighbourhood, out of a grand total of seventy-two. This is undoubtedly a fine list for one locality, especially when we consider that, of the remaining thirty-three species, fourteen are either very rare or only occasional visitors to our shores—e. g. *A. crataegi*, *P. daphidice*, *C. hyale*, *A. latona*, *A. niobe*, *A. dia*, *M. didyma*, *V. antiopa*, *V. virginienensis*, *D. erippus*, *S. ligea*, *P. virgaureæ*, *L. bætica*, and *L. acis*, while one, *C. dispar*, is practically extinct, and eight are local,—*P. machaon*, *M. cinxia*, *A. iris*, *L. pruni*, *L. arion*, *H. lineola*, *H. actæon*, and *C. palæmon*.

The following is a complete list of the Rhopalocera of Witherslack and district:—

Pieris brassicæ, *P. rapæ*, and *P. napi*. Common everywhere.

Euchloë cardamines. Common, end of May, in the lanes, Grange, Methop, Witherslack, &c.

Leucophasia sinapis. Common, near Witherslack and at Methop; only one brood, end of May.

Colias edusa. Common at intervals, in “*edusa* years.”

Gonepteryx rhamni. Common in lanes about Witherslack.

Argynnis selene. This species was formerly common on a piece of waste swampy ground near Witherslack, but cultivation and drainage are gradually stamping it out.

A. euphrosyne. Common, beginning of June.

A. aglaia. Not common, occurs about Witherslack sparingly; at Warton Crag it is fairly common, also on Arnside Knott.

A. adippe. Common during July and beginning of August.

A. paphia. Rare; I took one specimen near Witherslack last year—a record. This was no doubt introduced with farm produce.

Vanessa polychloros. Rare; one specimen taken by myself last year. The same remark applies to this as to *A. paphia*, vide supra.

V. urtica. Common everywhere.

V. io. Abundant. This is the commonest butterfly about in August.

V. atalanta. Fairly common.

V. cardui. Not quite so plentiful as *V. atalanta*.

Erebia epiphron. Common on the Langdale Pikes, Helvellyn, &c.

E. athiops. Common, beginning of August.

Pararge megæra. Common, May, June, July, and August, sunning itself on the walls.

Satyrus semele. Common, end of July and beginning of August, on rocky ground.

Epinephele ianira. No remarks needed.

E. tithonus. Odd specimens have been taken, but this species is rare; the nearest locality is near Heysham, on the Overton Road; end of July and beginning of August.

E. hyperanthus. Was formerly common in Maud's Wood, near Grange, but a hydro now stands there, and the grounds are enclosed and private. It has been taken near Kendal, but is evidently scarce.

Ctenonympha davus. Very common, end of June to mid-July, on all the mosses.

C. pamphilus. Vide *E. ianira*.

Thecla betula. Local; occurs on the Silverdale road, beginning of September.

T. quercus. Common about the oaks on Arnside Knott, mid-July.

T. rubi. Common during May.

Chrysophanus phlaeas. Common, odd specimens everywhere.

Lycena agestis. Fairly common, also var. *salmacis*.

L. icarus. Common; the second brood in September is diminutive.

L. corydon. Formerly common near Arnside Tower; also occurs on Warton Crag.

L. argiolus. Common; only one brood, end of May.

L. minima. Local; I only know of one locality, on the roadside, near the 'Derby Arms,' Witherslack.

Nemeobius lucina. Common, near Grange, end of May.

Nisoniades tages. Common on most of the heaths.

Hesperia sylvanus. Common.—C. H. FORSYTHE; Lancaster.

FIVE DAYS' COLLECTING AT DEAL.—Arrived at Deal on the morning of June 25th for five days. I was met at the station by a trap, which was to take me to my destination, Martinsfield, which is two and a half miles from the station, and is situated in the middle of the Deal sandhills. As we drove along I noticed a very large pair of *Cerura vinula* on a telegraph pole. After lunch I started off in quest of *Callimorpha dominula*, but was at first unsuccessful in finding the exact locality, which was not discovered until we again visited the spot on the next day. The larvæ were then found fairly commonly, feeding on nettle, bramble, sloe, and several low plants, though the majority were on the first two.

Porthesia chrysorrhæa larvæ were abundant on blackthorn, and single examples were also taken all round Deal. *P. similis* was not nearly as common as its usually far rarer relative. Larvæ of *Malacosoma neustria* were abundant on fruit trees at Worth and Sandwich, and odd larvæ of *L. quercus* were also picked up. The full-grown larvæ and cocoons of *Anthrocera filipendulæ* were very thick, both on the chalk at Kingsdown and in a certain spot on the sandhills; whilst two freshly emerged *A. trifolii* were also obtained. The much-eaten mallow produced larvæ of *Eubolia cervinata*, but searching for *Cucullia verbasci* produced only two small larvæ on *Scrophularia* (figwort), which was very abundant in the ditches on the sandhills and near Sandwich, where the larvæ were taken.

The most notable butterflies were *Pyrameis cardui* and *Cupido minima*; the first-named was quite common, but, of course, in very poor condition. As for *C. minima*, it abounded on the chalk around Kingsdown and Martin Mill. Five or six were often to be seen in company flying over low bramble bushes in some sheltered corner. Those taken were mostly in perfect condition. I have never known the species anything like so common before. Other butterflies noticed were *Pieris brassicæ*, *P. rapæ*, *Vanessa urticæ* (also larvæ of all sizes), *V. atalanta*, *Epinephele ianira*, *Ctenonympha pamphilus*, *Polymmatius phlaeas*, *Cyaniris argiolus*, *Lycena icarus*, *L. adonis* (a few males in grand condition), *Thanaos tages*, and *Hesperia sylvanus*.

The posts forming the uprights of the post and rail fences, so common in this part of the country, were well worth searching, especially for Noctuæ. At Kingsdown, *Hecatera serena* was the commonest moth taken in this way, whilst on the sandhills, where *Silene* is not so much in evidence, *Cucullia umbratica* was an easy first, about twenty being taken in an hour, and nearly all in first-rate condition. Other species thus obtained were *Dianthæcia conspersa* (one at Kingsdown), *Mamestra brassicæ*, *M. albicolon*, *M. anceps*, *Xylophasia polyodon*, *X. lithoxylea*, *Apamea gemina*, *Hadena dentina* (abundant), *H. oleracea*, *H. genistæ* (one), and *Hepialus lupulinus*.

A few *Arctia villica* were met with, and other insects taken or noticed by day-work were *Dianthæcia capsicola*, *Aplecta nebulosa* (one), *Plusia gamma* (fairly common), *Euclidia mi*, *Phytometra anea*, *Spilosoma lubricipeda*, *Melanthia ocellata*, *Melanippe galiata* (Kingsdown), *M. montanata* (Martin Mill), *M. subtristata*, *Camptogramma bilineata*, *Acidalia ornata*, *A. marginepunctata* (one only, at Kingsdown), *Asthena candidata*, *Cabera pusaria*, *Metrocampa margaritaria* (Worth), *Cidaria truncata*, *Lomaspilis marginata*, *Phibalapteryx vitalbata* (near Sandwich and Martin Mill), *Eupithecia rectangulata* (two, Deal and Worth), *Pionea forficalis*, *Pyralis costalis*, *Pyrausta purpuralis*, *Eurrhyncha urticata*, *Scopula olivalis*, *Ebulea crocealis*, *Cataglyphis lemna* (abundant, Sandwich), *Scoparia dubitalis* (abundant), and *Botrys pandalis*.

At night we treacled rows of posts on the sandhills. The first night turned out a blank, and, though there was a somewhat strong north-easterly wind on the other nights, there were plenty of insects at the sugar, especially on the last night. They were mostly, however, of the commonest. As soon as the treacle was on, and before it was quite dark, *Cherocampa porcellus* turned up in grand condition, but only two of them. The following were also attracted:—*Agrotis exclamationis* (far and away the commonest moth), *A. corticea* and *A. segetum* (both scarce), *Xylophasia polyodon*, *X. sublustris* (one), *Leucania comma* (abundant and fine), *L. pallens*, *Mamestra brassicæ*, *M. albicolon* (at first mistaken for *brassicæ* and passed over, but afterwards we obtained about a dozen, mostly in fine condition), *M. anceps*, *Miana strigilis* (dark forms with some reddish markings), *M. fasciuncula*, *Grammesia trigrammica*, *Apamea gemina* (not common), *Triphæna pronuba*, *Hadena chenopodii*, *H. oleracea*, and a few *Cucullia umbratica*, which I believe is not generally taken at sugar. Last, but not least, a fine *Neuria reticulata*. Light attracted, among commoner things, *Arctia villica*.

The Odonata were not particularly interesting, only seven species being noticed—viz. *Libellula quadrimaculata* and *L. depressa* (one of each), *Brachytron pratense*, *Platynemis pennipes*, *Pyrrhosoma nymphula*, *Agriön puella* (abundant), and *Ischnura elegans* (abundant).

A few species of Coleoptera were taken. The best were single specimens of the fine *Molytes germanus* (Kingsdown), and *Harpalus sabulicola*. The following were also obtained:—*Harpalus ruficornis*, *Donacia sericea*, *D. lemnae*, *D. linearis* (the last three near Sandwich on Iris), *Otiorrhynchus atroapterus* (in the sand), *Cneorrhynchus geminatus*, *Crypticus quisquilius*, *Discillus cervinus*, *Malachius viridis*, *Pyrochroa serraticornis*, and *Leptura livida*. Larvæ of *Hypera variabilis* were abundant on lucerne at Kingsdown, but beetles were not seriously worked.—F. M. B. CARR; 46, Handen Road, Lee, S.E.

RECENT LITERATURE.

Economic.—MR. W. J. LUCAS has written the first entomological leaflet in the "Nature-Knowledge" series, issued by the Agricultural Education Committee. It deals with the Lace-wing fly (*Chrysopa perla*), and is brightly and simply written; it should prove a valuable inducement to children for the acquisition of "nature-knowledge." ("Lace-wing or Golden-eye." "Nature-Knowledge" Leaflets, no. 9. 3 pp.; 3 figs. [No date.])

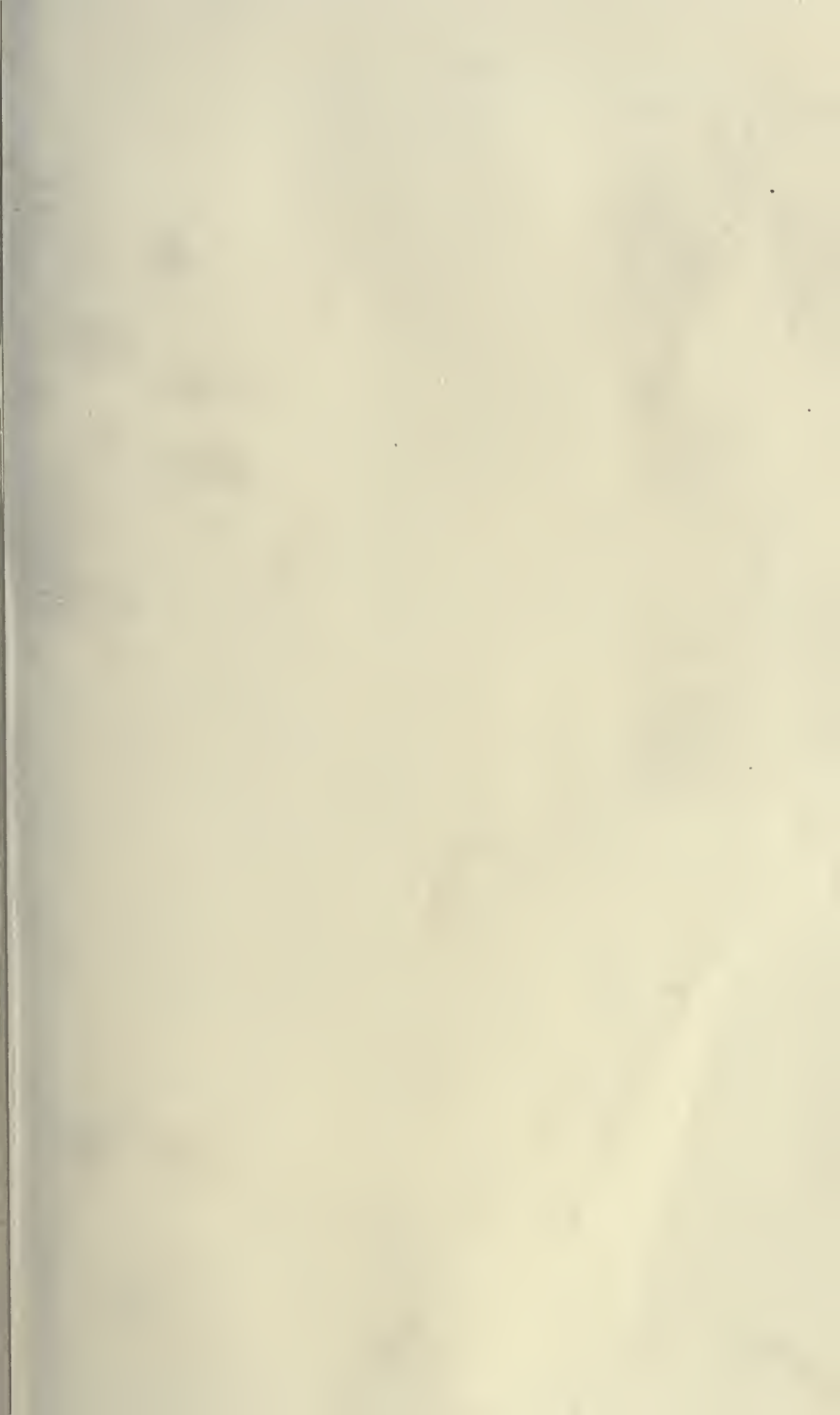
Rhynchota.—HERBERT OSBORN notes an interesting case of mimicry presented by the South African Tetigoniid *Cephaelus infumatus*, a species described some seventy years ago. The insect "is a little over half an inch long, of a brown colour, and has a remarkably prolonged head, which anteriorly tapers out into a very long spine. This prolonged head is almost one half the total length of the insect. The body is slender, and the wings terminate posteriorly, somewhat abruptly, but in such a manner that they fit very perfectly upon the stem of the plant which is its ordinary food. The protective feature comes in from the aborted leaf-sheaths on the stem of the plant, forming sharp spines occurring at intervals along the length of the stem, and these are perfectly reproduced in the form and colour of the insect. So close is the resemblance that, when a number of the spines are mounted separately alongside of the insects, it is very difficult to distinguish them without the most careful scrutiny." *Cephaelus* "lives on the rush *Dovea tectorum*, Masters, the spines of which are mimicked." (1902: 'Psyche,' p, 327.)

Neuroptera.—V. L. KELLOGG discusses the phylogeny of the Mallophaga, and calls attention to an earlier paper published by him in 1896 ("New Mallophaga, &c.," in Contrib. to Biol. from Hopkins Seaside Lab., vii.; 117 pp., 14 Plates). From evidence based upon the structure, principally of the mouth-parts and, in a less degree, of the internal organs, the author concludes that the Mallophaga are degenerate Psocidæ, the wingless *Atropos* forming an important link. (1902: 'Psyche,' ix., pp. 339-43, "Are the Mallophaga degenerate Psocids?")

G. W. K.

OBITUARY.

MR. J. B. WILLIAMSON died at Slough on June 21st last, at the age of seventy-four years. The present writer had known him for over ten years, and esteemed his friendship very highly. He was by profession an artist, and formerly a frequent exhibitor in the Academy, principally in water-colour. He was first led to take up entomology on account of the assistance the wing-colouring of the Lepidoptera gave him in the study of colour and in designing. He formed a very fine collection of British Lepidoptera, but owing to failing health he had been unable for some years to keep in touch with other entomologists, though there are still many readers of the 'Entomologist' who will remember him.—E. S. C.





W. J. Lucas, del.

Meriania argentifera, Meig. ($\times 3.$)

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MERIANIA ARGENTIFERA, MEIG., A TACHINID NEW TO BRITAIN.

BY COLBRAN J. WAINWRIGHT, F.E.S.

(PLATE III.)

AMONGST a few Diptera sent to me for identification by Mr. W. J. Lucas in the early part of this year, I found a specimen of this species, which, so far as I know, is quite new to the British list. Novelties are by no means uncommon in this comparatively little-known family; at the same time, I was interested in recognizing such a well-characterized and handsome species, and, as Mr. Lucas has prepared very excellent drawings of the fly, and of the side view of its head, some account of it may be generally interesting.

The Tachinidæ form a very large group of the *Calyptrate Muscidæ*, nearly allied to the common "blue-bottles," and including the very abundant and familiar Sarcophagidæ, or flesh-flies. Many of the species are parasitic upon other insects, and in consequence some of them have made themselves unpleasantly known to breeders of Lepidoptera, who have found them in their breeding-cages in place of the expected and more desired butterfly or moth.

We have in this country a quite uncertain number of species, probably about three hundred, and possibly many more. Owing to the fact that they are mostly very much alike, and the specific distinctions minute and often indefinite, they have received very little attention, and consequently are little known; and a number of species undoubtedly remain undetected and unidentified. Moreover, those that are known are often little understood—their limits indeterminate and their nomenclature in a muddle. New names and new species, therefore, are more nearly the rule than

the exception in this group. *Meriania argentifera*, Meig., is, however, more than usually clearly defined, and is rather a fine insect, as will be judged from Mr. Lucas's drawing.

The genus *Meriania* was founded by Robineau Desvoidy, or rather the name was created by him, in his 'Essai sur les Myodaires,' 1830. Whether his names should ever be adopted at all is a question, and *how* they are ever identified with anything is a wonder to me. He monographed the whole of the big family of *Muscidæ* (*sens. lat.*), and only very occasionally deigned to notice anyone else's work. He renamed everything, genera and species alike; he split up genera and species so that in many cases a genus represented a species, and was of the value of a species only, and the included species were only the various sexes and forms of the one species; and he characterized all so feebly that they seem to me quite unrecognizable, as a rule. However, Brauer and von Bergenstamm, in their 'Vorarbeiten zu einer Monographie der Muscaria Schizometopa (exclusive Anthomyiidae),' the most important work on the Tachinidæ yet published, revive his name *Meriania* for this genus. Brauer and Bergenstamm give *argentifera*, Meig., as the type. Of the three species (all new names) placed by Robineau Desvoidy in his genus, however, *silvatica* and *borealis* are both definitely identified with *puparum*, F., by Macquart in the 'Annales de la Soc. Entom. de France,' 1848, p. 122; and the other one is a Cape species; so that it seems to me that *puparum*, F., should be the typical species, and *argentifera* cannot be, as it was not in the original genus at all.

Rondani, in his 'Dipterologiæ Italicæ Prodrömus,' vol. i., p. 64, and vol. iii., p. 74, creates a genus *Platychira*, quoting *puparum*, F., as the type, and including other species—*radicum*, F., *strenua*, Meig., &c.—which are now recognized as abundantly distinct. This genus was constituted practically in the same manner as the genus afterwards familiar as *Nemoræa*, and as it is cotypical with *Meriania*, R.D., the name must go at once as a useless synonym.

Schiner, Macquart, Verrall (in his first 'List of British Diptera'), and others recognized a big genus, *Nemoræa* (another name of Robineau Desvoidy, is used, however, in a much wider sense than he intended), and merged *puparum* into it. The name by which it is familiarly known, therefore, is *Nemoræa puparum*. This genus contained a number of closely allied common species distinct from *puparum*; and that species, together with its close ally *argentifera*, always formed a section apart, distinguished at once from all the others by their hairy cheeks. Finally, Brauer and Bergenstamm, in the work already referred to, showed how different they were, and removed them not only to another genus, for which the name *Platychira*, Rdi., was first adopted (part i., p. 86), afterwards changed to *Meriania*, R. D. (part iii., p. 112),

but also finally placed them in a distinct section, far away from the true *Nemoræa* species, calling the section *Platyichira*; and Verrall, in his revised 'List of British Diptera,' published 1902, accepts the name *Meriania*, and gives *puparum*, F., as the one British representative. *Platyichira*, with its single genus *Meriania*, is well characterized by the facts that the facial angles (*a*) stand well above the mouth edge (*b*), which projects between them; that the cheeks (*c*) are very hairy, as well as the eyes; that the third antennal joint (*d*) is short and broad, and but little longer than the second (*e*); and that the female has its fore tarsi flattened out. The other characters of venation, &c., which are less distinctive, can be gathered from Mr. Lucas's excellent drawings.

N. puparum, F., has been known as British since Walker's time, but, so far as my knowledge goes, seems to be always rare. I have never met with it myself, and only possess one British specimen, a fine large male taken at Holmbury last April by Dr. T. A. Chapman. This particular specimen is fully 6 lines long, and is larger than any of my Continental types. It is a handsome, robust-looking insect; the general colour brown, with the scutellum and the sides of the second and third abdominal segments red, with interrupted white shimmering bands occupying the fore half of the second to the fourth abdominal segments; the head dark greenish brown, with a golden shimmer on the lower parts, and the usual dark line on the frons; the palpi are yellow; the antennæ and legs all black; the whole insect very hairy, with discal and marginal macrochetæ on the abdominal segments, the remaining characters being the same as shown in the drawing of *argentifera*.

N. argentifera, Meig., seems to be a smaller insect. The one male taken by Mr. Lucas is barely $4\frac{1}{2}$ lines long, and looks about half the size of Dr. Chapman's *puparum*. I expect, however, that as a rule the difference is not great, and, of course, in the Tachinidæ, size is of little, if any, value for specific distinctions. The principal difference between *puparum* and *argentifera* is that in the former species the hairs on the cheeks (*c*), and many of those on the chins (*f*) and back of the head (*g*), are pale (Schiner says white, but in mine they are golden, and I expect they are always so in fresh specimens), whilst in *argentifera* they are black throughout. Other differences are, that in *argentifera* the general colour is more blue-black than brown, and the white shimmering bands on the abdominal segments are very faint, and only to be seen plainly at the sides. Schiner says that the forehead in the male of *argentifera* is wider than in *puparum*, taking up "almost one-third of the whole head-width"; it is certainly a little wider in Mr. Lucas's specimen than in *puparum*, but not much, and certainly does not take up one-fifth of the total head-width. Schiner also says that the red on the abdomen is less noticeable

in *argentifera*, but in these two specimens I have before me there is little difference in that respect. The red abdominal markings in the Tachinidæ are, however, always very variable, and of little specific value.

Mr. Lucas obtained his specimen in the New Forest, on April 30th, this year. Both species of *Meriania* appear to be always early spring insects, and possibly for this reason have been overlooked, as few Diptera appear so early in the year, and dipterists are accordingly not often out collecting them. Schiner says that they occur "in the earliest spring, on sunny tree-trunks, and like to sport with one another and with other *Muscidæ*." Brauer records the breeding of *argentifera* from a lepidopteron, *Mesogona oxalina*, Hb.; and *puparum* has been bred from *Panolis piniperda*, Pz.

I have to thank Mr. Lucas for kindly presenting me with the, at present, unique British specimen.

ON THE LARVA OF *LIPHYRA BRASSOLIS*, WESTW.

By DR. T. A. CHAPMAN, F.E.S.

(Concluded from p. 228.)

PERHAPS the most remarkable thing about this remarkable larva is the modification which has affected the prolegs. When we examine the soft under side of the larva, the head, true legs, and prolegs are seen very much as in the young larva; the head, however, is nearly white, and so are the true legs, except the tarsal tips.

Beginning at the margin of the dorsal shield where it sets down on the surface on which the larva may be resting, we find that the shagreened points of the general surface carry hairs of various lengths, some almost evanescent, others nearly .25 mm. long; these no doubt assist in making the opposition of the larva to its resting place more complete. These seem to be true hairs jointed at the base, and the points over the dorsum are probably also really hairs rather than spicules. The shagreened dots are about .08 mm. in diameter. As one passes inwards from the margin, the hairs get rather thicker, and retain their length of .2 to .28 mm., the shagreened bases lose all chitinous colour, and, a short way in, is apparently a smooth surface, thickly studded with white, short, thick hairs; as we approach the prolegs these get shorter and sharper, and fail altogether at a line just below the summit of the column, at top of which is the retractile portion of the leg. Then, just at the margin of the summit of the column, is a compact circle of crotchets, that differ in no very decided manner from those ordinarily found on

prolegs. Within this circle is a white projecting mass of tissue, with a ridge along its summit from front to back, with parallel striæ running down to the margin. The crotchets are hooked outwards, have a short flat base applied to the surface of attachment, and, without forming two or three regular rows, are in more than one row. The little smooth space outside them gives them room for movement without being interfered with by the hairs that clothe the rest of this under surface.

These circles of crotchets, which are to all appearance identical with the complete circles found on the prolegs of "Micro" larvæ, are not the ordinary crotchets at all, but an entirely new structure. The true crotchets exist in the young larva, but in this full-grown one are merely represented by the striæ on the central fleshy mass noticed, which is really the true proleg; the crotchets here existing are round the summit of the pillar, at the centre of which the true proleg is here, as often, placed. Its method of working must be very similar to that of the "Micro" full circle, but, instead of having a central tendon as they have, it has the whole proleg structure, by the movement of which it must be expanded and contracted so as to take and relax its hold.

The true legs are rather small and rather thick, and densely or at least very closely and regularly clothed with fine white hairs, and terminate in a claw; slightly hooked, slender as compared with the last joint of the leg, dark in colour, making it look very strong and sharp, and capable of being flexed, so as to fold up on to the last (tarsal) joint of the proleg, reminding one of the tibiæ of *Nepa* or *Mantis*.

The head is nearly colourless, about 1.7 mm. wide; centrally below the mouth, and pointing backwards, is the labium or part of it, a pale conical rather than cylindrical process ending in a short chitinous tube (spinneret?). On each side is a long palpus (maxillary?) of three joints, the last very small, projecting ventrally, and apparently with a fleshy process (maxilla?) towards the middle line; in front is a tolerably normal labrum, square and notched below, with a good many short hairs on its anterior surface. The antennæ are very long, about 1.1 mm., and regularly clothed with fine hairs; I cannot recognize a basal joint, if there is one; the next, therefore however, first, is very long, 1 mm., and also thick about .22 mm.; the last joint is a small square piece about .1 mm.

The labrum is very fixed in its position and moves little; even if I am deceived in this matter by having only stiff preserved specimens to deal with, it is certain that it fits down very closely and tightly laterally in the maxillary bases, leaving in front an oval opening between it and the labium, within which the jaws are visible, with apparently some room for movement in the cavity thus formed.

Each jaw carries three teeth, not mere notches as in Lepidoptera generally, but each tooth is a long sharp spine, capable of piercing, but certainly not of biting; each jaw is probably capable of meeting the other, so that the teeth may interlock, but in the specimens examined one jaw is entirely in front of the other.

The eye-spots are six, five of them in a semicircle, the other separate.

The head, which looks sunk into the white fleshy tissue of the under side of the larva, is really very moveable, and has a definite neck (?), so that the mouth-parts, which are at front of head and point more or less forwards, can be directed directly backwards, between the true legs, exposing the front or dorsum of the head, which is rather longer than broad, nearly colourless, and has some hairs, and the usual suture marking off the clypeus.

I should like, by again mentioning, to emphasize what seems to me as remarkable a feature as any it possesses—*viz.* the development, *de novo*, of a "Micro" proleg, by the obsolescence of the real crotchets, though not of the base that carries them, and by the appearance of an entirely new set of crotchets round the base of the proleg proper.

Not so remarkable as a structural modification, but more so, perhaps, as connected with most unusual habits, is the modification of the jaws, as piercing and tearing and no longer biting organs, and, if I observe correctly, the alteration of the trophi into a suction tube, from which the jaws are just able to protrude; remarkably similar, functionally, to the tube surrounding the jaws in *Phyllocnistis*, though the details of structure and habits are so widely different.

The jaws would most effectively take a hold of the skin of an ant larva, piercing its skin at the same time in six places; they would then draw the piece so seized within the closed cavity formed between labrum, labium, and (laterally) maxillæ, so that the juices of the larva could be easily sucked out.

There is also a larva of intermediate size, which differs from the larger one in nothing except perhaps that the spiracles are more readily seen than in the full-grown one.

The pupa I have before me is very large, 28 mm. long, 14 mm. broad, and 10 mm. deep, whilst it is depressed in front, in a way apparently due to pressure; were the rounded contour of the dorsum and sides continued its depth would be 12 mm. It is typically Lyncæid in form, being very round at either end, broadest at fourth and fifth abdominal segments, narrower thoracically; head beneath; no moveable segments; no trace of cremastral hooks or of any silken girth; first leg equally against head and antennæ. The maxillæ are well developed; they appear to contain no maxilla (the specimen being close on emergence),

but the labial palpi are very evident beneath them. The most special feature of the pupa is a set of flanges, or raised ribs. If the pupa were divided into a dorsal and ventral piece, by a section through its widest dimensions, the line of section would mark one of these ribs, which starts round the abdominal segments from the anal angle of the wings (end of vein 1 c), and goes round the end of the pupa, dividing the last segment into two portions; this segment is consequently of considerable antero-posterior dimensions, stretching a good way under the pupa, but also having a portion, as it were, lifted right out on to the dorsum by having to be above the flange. The segmental incisions are all raised into double ridges, but ventrally, *i. e.* below the marginal flange above noted, but with no trace of anything of the sort above it, each segment has another single ridge or flange about one-third of the way in front of each incision. The scars of prolegs are well-marked by large areas into which these ribs do not intrude.

These flanges are obviously the remains of the great marginal border of the caterpillar, and of the division beneath it of each segment into two. The marginal ridge extends forwards through the wings, but the pupal shell is so delicate that it is difficult to say whether this ridge is in the wing-covers, or an indication of a flange on the segments beneath them, showing through.

The spiracles are more obvious than in the larva, and occupy a similarly dorsal position. The pupa is very smooth and polished at least thoracically; the abdomen has very numerous, almost microscopic hair-points.

I have also a specimen of the pupa within the larva skin. This fully illustrates Mr. Dodd's account of how pupation occurs. The larva skin becomes a little altered by the dorsum being rather raised and rounded, but substantially it is the adult larva one sees, and this forms a case or cocoon, precisely as happens in the pupation of the *Muscidæ*.

The pupa inside lies quite free from any attachment to the skin, but the ventral depression of the pupa is due to its having to fit on the ventral aspect of the larval skin, which is raised centrally by the head, legs, prolegs, &c.

The larval skin dehisces by cracking round the marginal crest in front, by a crack across the front of the three ridges, *i. e.* between third and fourth abdominal segments. The semi-circular portion thus marked off again divides longitudinally into two portions; in my specimen one of these portions is missing, the other loose.

[A plate illustrating the early stages of *Liphyra brassolis* is being prepared, and will be published in the present volume.—
ED.]

DESCRIPTION OF A NEW SPECIES OF CICADIDÆ FROM CEYLON.

By W. L. DISTANT.

COSMOPSALTRIA GAMAMEDA, sp. n.

♂. Head and pronotum greenish ochraceous—possibly pale green in fresh specimens; head, front with black carinæ on each side, leaving a pale spot at base and a smaller spot at apex, vertex with the area of the ocelli connected obliquely with a lateral streak, black, eyes piceous; pronotum with two central discal lines connected at anterior margin, two contiguous converging spots near centre of posterior margin, the margins and incisures black; mesonotum with a central discal line, on each side of which is a broader curved lineate fascia, followed by two small spots on anterior margin, a lineate fascia on each lateral area, and a small spot near each anterior angle of the cruciform elevation, black; abdomen brownish ochraceous, the lateral and basal areas paler ochraceous, with a small central black spot on basal segment; sternum, rostrum, and legs pale ochraceous, abdomen beneath brownish ochraceous; basal margin of face, excluding central spot, striated with black, and a black fascia between face and eyes; apices of femora and tibiæ more or less piceous. Tegmina and wings hyaline, the venation ochraceous, here and there tinged with fuscous. Body robust, oblong, slightly greyish tomentose; face not prominently gibbous, obliquely transverse and moderately striate; rostrum reaching apex of posterior coxæ, its apex piceous; opercula short, subtriangular, a little sinuate outwardly, obliquely straight inwardly, apices subacutely rounded and reaching the third abdominal segment.

♀. Abdomen above reddish ochraceous.

Long. excl. tegm. ♂ 39, ♀ 31 millim.; exp. tegm. ♂ 110, ♀ 105 millim.

Hab. Ceylon; Pundalu-oya (E. E. Green).

Allied in markings above to *C. vibrans*, Walk., but a larger species, with a broader head and the opercula altogether different.

Synonymical Note.

Mr. Matsumura, who has studied Dr. Horvarth's types at Budapest, and who recently passed through London on his return to Japan, informed me that *Leptopsaltria japonica*, Horv. = *Pomponia japonensis*, Dist.; both descriptions published in 1892. He wished to know the date of publications, and I have looked into the question.

Pomponia japonensis.

Pomponia japonensis, Dist., Mon. Orient. Cicad. p. 102 (Part V. pp. 97–120, May, 1892).

Leptopsaltria japonica, Horv. Termész. Füzetek, xv. p. 136 (October 31st, 1892).

A CONTRIBUTION TO THE CLASSIFICATION OF THE COCCIDÆ.

By T. D. A. COCKERELL.

(Concluded from p. 233.)

Walkeriana, Signoret.

Walkeriana, Signoret, Ann. Soc. Ent. France, 1875, p. 390. Type, *floriger*.

♀. More or less covered with dense waxy lamellæ; antennæ 10-jointed.

Species.—*W. floriger*, Walker, *W. compacta*, Green, *W. euphorbiæ*, Green, *W. polei*, Green, and *W. senex*, Green, Ceylon.

W. pertinax, Newstead, and *W. andreæ*, Green, Central Africa.

Section *Aspidoproctus*, Newstead, P.Z.S., 1900, p. 948. Female. Genital opening covered by a flap; waxy processes small, not covering body. *W. pertinax*.

Icerya, Signoret.

Icerya, Signoret, Ann. Soc. Ent. France, 1875, p. 351. Type, *seychellarum*.

Proticerya, Cockerell, Psyche Suppt., 1895, p. 15. Type, *rileyi*.

Crossotosoma, Douglas, Ent. Mo. Mag. March, 1890, p. 79. Type, *ægyptiaca*.

♀. Soft, with a long (usually ribbed) posterior ovisac; antennæ typically 11-jointed.

♂. Without caudal processes.

Species.—*I. seychellarum*, Westw., islands of Indian Ocean; *I. natalensis*, Douglas, Natal; *I. albolutea*, Ckll., W. Africa; *I. formicarum*, Newstead, India; *I. ægyptiaca*, Douglas, Egypt, Ceylon; *I. tangalla*, Green, Ceylon; *I. crocea*, Green, Ceylon; *I. pilosa*, Green, Ceylon; *I. purchasi*, Maskell, Australia, &c.; *I. koebeleii*, Maskell, Australia.

I. brasiliensis, Hempel, Brazil; *I. schrottkyi*, Hempel, Brazil; *I. montserratensis*, Riley-Howard, West Indies; *I. palmeri*, Riley-Howard, Mexico; *I. rileyi*, Ckll., New Mexico; *I. littoralis*, Ckll., Mexico.

Section *Proticerya*, Ckll. Female antennæ 9- to 10-jointed. *I. rileyi*, *I. littoralis*.

MARGARODINÆ.

Margarodes, Guilding.

Margarodes, Guilding, Trans. Linn. Soc. Lond. xvi. (1829), p. 115; Giard, C. R. Soc. Biol. Feb. 10th, 1894, p. 412. Type, *formicarum*.

Porphyrophora, Brandt, Mem. Ac. St. Petersb. 1834, 1835.

Sphæraspis, Giard, C. R. Soc. Biol. Nov. 10th, 1894, p. 712. Type, *vitium*.

Subterranean, anterior legs of both sexes adapted for digging.

♀. Adult soft, mouth absent, legs and antennæ present; intermediate stage hard, globular, more or less like a pearl, with no legs.

Species.—*M. gallicus*, Signoret, France; *M. hameli*, Brandt, Armenia; *M. perrisi*, Signoret, France; *M. polonicus*, Linné, Poland.

M. trimeni, Giard, S. Africa; *M. capensis*, Giard, S. Africa.

M. formicarum, Guilding, West Indies; *M. rileyi*, Giard, West Indies; *M. hiemalis*, Ckll., New Mexico; *M. vitium*, Giard, Chile.

Section *Sphæraspis*, Giard. Intermediate stage ovoid, without any appearance of segmentation. *M. vitium*, *M. capensis*.

Section *Porphyrophora*, Brandt. Anterior legs less swollen; antennæ with 7 to 9 joints. *M. hameli*, *M. polonicus*, *M. gallicus*, *M. perrisi*.

Cælostomidia, Cockerell.

Cælostomidia, Cockerell, 'Nature,' Feb. 15th, 1900, p. 367. Type, *zealandicum*.

Cælostoma, Maskell, Trans. New Zealand Inst. xii. (1879), p. 294. Type, *zealandicum* (not *Cælostoma*, Brullé, 1835).

♀. Soft, with legs and antennæ, but no mouth. Anterior legs in both sexes normal.

♂. With no caudal brush.

Species.—*C. assimilis*, Maskell, *C. wairoensis*, Maskell, *C. zealandica*, Maskell, *C. compressa*, Maskell, and *C. pilosa*, Maskell, New Zealand.

Subgenus *Ultracælostoma*, Ckll. Female. Adult without mouth or legs; antennæ with about five joints, more or less rudimentary. *C. assimilis*.

Callipappus, Guérin.

Callipappus, Guérin-Ménéville, Rev. Zool. 1849, p. 129; Fuller, Trans. Ent. Soc. Lond. 1899, p. 435. Type, *westwoodi*.

♀. Body more or less triangular, thin in front; abdomen with only the first two or three segments visible, the rest forming a pouch which contains the eggs. Antennæ 10- or 11-jointed. Mouth absent.

♂. With a caudal brush.

Species.—*C. westwoodi*, Guérin; *C. australis*, Maskell; *C. immanis*, Maskell; *C. rubiginosus*, Maskell; *C. farinosus*, Fuller; *C. bufo*, Fuller: all from Australia.

Sasakia, Kuwana.

Sasakia, Kuwana, Proc. Calif. Acad. Sci. 1902 (not yet published).

♀. "Enclosed in cottony secretion; antennæ 9-segmented; body

distinctly segmented; no digitules on claw nor on tarsus; mouth wanting in adult; anal tube absent." (Kuwana.)

Species.—*S. quercus*, Kuwana, Japan.

Xylococcus, Loew.

Xylococcus, Loew, Verhandl. d. k. k. Zool.-Bot. Ges. xxxii. (1882), p. 271; Pergande, Bull. 18, n. s., Div. Ent. Dep. Agric. (1898), p. 18. Type, *filiferus*.

♀. Antennæ 9-jointed; legs well-developed; mouth absent; digitules present, but without knobs. In all stages between larva and adult the mouth is present, and the legs and antennæ are absent.

♂. With an abdominal brush. Arboreal insects, living on *Tilia*, *Betula*, and *Quercus*.

Species.—*X. filiferus*, Loew, Central Europe; *X. betulæ*, Pergande, North America; *X. quercus*, Ehrhorn, California.

ORTHEZIINÆ.

Orthezia, Bosc.

Orthezia, Bosc, Journ. de Phys. xxiv. (1784), p. 171; Lounsbury, 32nd Ann. Rep. Mass. Agr. College. Type, *characias* (= *urticæ*).

Cyphoma, Gistel, Nat. des Thier. (1848), p. 151. Type, *characias* (not *Cyphoma*, Bolt. 1798).

♀. Body compact, short, more or less covered with waxy white lamellæ; a more or less elongated ovisac of firm texture; legs long and well-developed; antennæ 8- (rarely 7- or 9-) jointed; mouth well-developed.

♂. Eyes compound; abdomen with a caudal brush.

Species.—*O. cataphracta*, Shaw, Northern Europe, Siberia, Greenland; *O. urticæ*, Linné, Europe; *O. delavauxi*, Thieb., Europe; *O. floccosa*, De Geer, Europe; *O. mænariensis*, Douglas, Italy.

O. occidentalis, Douglas, Colorado, New Mexico; *O. annæ*, Ckll., New Mexico, &c.; *O. nigrocincta*, Ckll., New Mexico; *O. sonorensis*, Ckll., Mexico; *O. artemisiæ*, Ckll., New Mexico; *O. garryæ*, Ckll., New Mexico; *O. monticola*, Ckll., New Mexico; *O. cheilanthei*, Tinsley, New Mexico; *O. graminis*, Tinsley, New Mexico; *O. lasiorum*, Ckll., New Mexico.

O. insignis, Douglas, Tropics of the New World, Ceylon; *O. prælonga*, Douglas, Tropics of the New World; *O. ultima*, Ckll., Argentine Republic.

Section *Arctorthezia*, Ckll. Waxy secretion dense, not easily removed; wedge-shaped lamellæ in dorsal line. Boreal types. *O. occidentalis* (type of section), *O. cataphracta*.

Ortheziola, Sulc.

Ortheziola, Sulc, S.B. Bohmisch. Ges. 1894, p. 5.

♀. Similar to *Orthezia*, but antennæ 4-jointed.

Species.—*O. vej dovskiyi*, Sulc, *O. signoreti*, Haller, Europe; *O. fodiens*, Giard, Guadeloupe.

PHENACOLEACHINÆ.

Phenacoleachia, Cockerell.

Phenacoleachia, Cockerell, *Canad. Entom.* 1899, p. 274.

♀. Form elongated, labium long; anal ring with six hairs; antennæ 11-jointed, with curved spines at the end.

♂. With two long caudal filaments; and compound eyes consisting of ocelliform bodies forming a single ring round the head, interrupted above and below.

General form of both sexes resembling the *Dactylopiini*.

Species.—*P. zealandica*, Maskell, New Zealand.

ON THE MORPHOLOGY AND CLASSIFICATION OF THE AUCHENORRHYNCHOUS HOMOPTERA.

By DR. H. J. HANSEN.

(Continued from p. 236.)

IV.

As above mentioned, I accept the classification of the Auchenorrhynchous Homoptera into four families (proposed by STAL in 'HEMIPTERA AFRICANA,' vol. iv.), with the limitations for these given by him. At the same time, STAL's fundamentals of this system are very defective, so that not one of the later authors, not once even J. SAHLBERG, has adopted them. I now attempt to collect the chief points of the new results of my researches, with the earlier known facts for an analytical table of the family characters.

The exclusive characters are printed in italics, the not absolutely exclusive but well characterized structures are printed in ordinary type.

When one has to deal with several types (here families) the nature of the analytical table sometimes causes a difficulty, *i. e.* the strong emphasizing of a character absolutely peculiar to one family (for instance, the absence of an empodium in the *Stridulantia* in contradistinction to its presence in all the other families); I have endeavoured to obtain this by the employment of special printing; square brackets are used for sentences inserted, and are not used when a special point is to be brought into relief.

A. Second segment of peduncle of the antennæ without sensory organs, flagellum with several or many sensory foveæ. Intermediate coxæ with the intero-basal angles a little remote inter se; coxal ab-

duction somewhat small. *Metasternum* either entirely chitinous, or with two medium-sized membranous areas. Posterior *coxæ* mobile, trochantins apparent; posterior trochanters a little or not wider than the femora; a flexion only possible between trochanter and femur; posterior femora without a "yellow spot" on the upper surface. Pleura of third to eighth abdominal segments entirely located on the lower side, formed of a larger exterior chitinous plate, and of an interior narrower area, partly membranous or evanescent.* First pair of abdominal spiracles placed either laterally or ventrally. Third to eighth pairs placed ventrally, looking downwards. Tegulæ always absent.

a. Three ocelli.

Flagellum consisting of five (or four?) elongate segments; sensory foveæ very numerous in the two basal segments of the flagellum (some even found in the other segments). Conspicuous part of the mesonotum very large. Anterior femora very different from the intermediate pair [*always considerably incrassate*]. No empodium. Second pair of abdominal spiracles placed in a transverse ventral furrow, looking anteriorly and medianly; third to seventh pairs placed in the sternites, not in the pleura. Stridular organ present in the male. Antennæ always placed in deep pits in front of the eyes under the anterior margin of the vertex. Tegmina unarmed beneath. Anterior margin of the wings a little curved towards the base, unarmed. *Metasternum* entirely chitinous. Posterior scarcely wider than the intermediate *coxæ*, never reaching to the lateral margin of the thorax. Posterior femora simple, posterior tibiæ cylindrical.

1. Stridulantia.

b. Ocelli two or none. Flagellum composed of either numerous segments, or of an inflated basal segment and a very slender "seta"; some sensory foveæ present, never numerous. Conspicuous part of the mesonotum medium-sized, or small or absent. Anterior femora scarcely different from the second pair [most often not incrassate].† A large empodium present. Second pair of abdominal spiracles placed laterally, looking exteriorly or partly upwards. Third to eighth pairs placed in the pleura. No stridular organ.

a. Flagellum composed of a large subpyriform basal segment, and a very slender "seta"—generally subarticulate; basal segment with some sensory organs, "seta" without them. Tegmina with a carina towards the base on the lower surface. Anterior margin of wings towards the base with a triangular plate, which is furnished on the exterior margin with some hooks. *Metasternum* somewhat long, with two medium-sized membranous areas. Posterior *coxæ* scarcely wider than the intermediate pair, not reaching to the lateral margin of the thorax.

* In *Cystosoma* entirely coalesced with the tergites and sternites.

† In *Darnis*, Fabr., the anterior and intermediate femora are strongly incrassate.

Posterior femora towards the base on the upper surface with a wider transverse keel. *Empodium* thicker, beneath with two chitinous spinose strips, the free margin a little or scarcely emarginate. Eyes always placed on the vertex towards the base. Antennæ always placed in deeper pits in front of the eyes under the anterior margin of the vertex. Intermediate coxæ with a strong meracanthus. Posterior tibiæ cylindrical, each with a single process, or with two conical larger processes on the outer surface.

2. Cercopidæ.

β. *Flagellum* always composed of numerous segments; basal part longer, formed either of some (2-6) segments, or transversely furcate, furnished with some scattered sensory pits; distal part divided into many segments, at least in part. *Tegmina* beneath not carinate. Anterior margin of the wings without a triangular plate, sometimes somewhat convex. *Metasternum* short, entirely chitinous. Posterior coxæ much wider than the intermediate pair, extending as far as to the lateral margin of the thorax. Posterior femora simple at the base. *Empodium* thinner beneath, without apparent chitinous spines; free margin profoundly incised medianly. Ocelli sometimes on the vertex, sometimes on the front, occasionally evanescent. Antennæ usually inserted in front of the eyes, sometimes under the eyes. Intermediate coxæ somewhat rarely with a meracanthus. Posterior tibiæ very often prismatic or foliaceous, very rarely almost cylindrical, generally seriately spinulose, very rarely unarmed.

3. Jassidæ.

B. Second segment of the peduncle with many or very many peculiar (composite) sensory organs; flagellum with a single larger sensory organ on the pyriform basal segment. Intermediate coxæ with the intero-basal angles considerably or very distant inter se; coxal abduction well developed. *Metasternum* almost entirely membranous, and this thin cuticle is extended outwards to the lateral parts of the metathorax, which is inflected somewhat on the lower side of the body. Posterior coxæ immobile, their exterior part coalesced with the metathorax; trochantins absent. Trochanters very much stouter than the posterior femora; both an adduction and a flexion possible between trochanter and femur. Posterior femora with a "yellow spot" near the base on the upper surface. Pleura of the third to eighth segments largely or altogether situated laterally, either altogether membranous, or with a large upper area in large part or altogether membranous, and a lower plate chitinous. First pair of abdominal spiracles situated dorsally within the exterior produced part of the metanotum. Third to eighth pairs situated essentially laterally, and in large part or altogether turning outwards.

Ocelli more rarely evanescent, more often two at the sides of the head in front of the antennæ; sometimes a third ocellus is found on the lower margin of the front near the base of the clypeus. Antennæ inserted under the eyes; flagellum composed

of a thicker basal segment, and a very slender "seta," either exarticulate, or partly or altogether divided into numerous segments. Tegula almost always present. Empodium coalesced with the claws throughout a shorter distance, and at most through two-thirds of the length of the claws; free margin a little emarginate or simple. Second pair of abdominal spiracles dorsal, somewhat remote from the lateral margin.

4. Fulgoridæ.

(To be continued.)

ON SOME NEW GENERA AND SPECIES OF HYMENOPTERA (ICHNEUMONIDÆ, CHRYSIDIDÆ, FOSSORES, AND APIDÆ).

By P. CAMERON.

(Continued from p. 241.)

SPHEGIDÆ.

AMPULEX LONGICOLLIS, sp. nov.

Cærulea, antennis pedibusque nigris, femoribus posticis dimidio basali rufo; alis fusco-violaceis. ♀. Long. 16-18 mm.

Hab. Khasia (coll. Rothney).

Antennæ black, sparsely covered with black hairs; the third joint twice the length of the fourth. Head dark purple, the cheeks and oral regions of a brighter tint; the front and vertex coarsely rugosely punctured; the former with a keel down the apical two-thirds. Clypeus aciculated, stoutly keeled down the middle, and sparsely haired; the apex rounded; the sides armed with an oblique longish tooth. Mandibles black, keeled down the middle and at the sides. The front and vertex are sparsely haired. Thorax blue, mixed with purple and green; the median segment for the greater part indigo-blue. Prothorax smooth, aciculated, and with a few scattered punctures; its base distinctly separated, and the apex is depressed; the apical part narrowed towards the apex and transverse at the base; the prothorax is if anything longer than the mesothorax, which bears large deep scattered punctures, as do also the scutellum and post-scutellum; these are sparsely covered with long black hair. The central keel on the median segment is straight, and reaches shortly beyond the middle; the second keel is of similar length; the outer longer, reaching to the apex; the segment is stoutly transversely striated, the striæ becoming more curved and irregular at the apex of the keels; the middle part at the apex is smooth; the apex of the segment is perpendicular, and ends at the sides above in stout teeth. Mesopleuræ coarsely irregularly punctured; the metapleuræ with a longitudinal keel below the keel which ends in the tooth; the space between the two bearing, near the middle and apex, some straight keels; the base below is aciculated, the rest reticulated. Mesonotum bearing large deep round punctures; its base smooth; the middle furrow deep.

Legs blue; the tarsi black; the apex of the hinder femora and the tibiæ black; the basal half of the hinder femora red. Wings fuscous-violaceous, more hyaline in the discoidal cellules. Abdomen blue, shining; the basal half of the petiole very narrow; the apical half abruptly dilated, and distinctly narrower than and separated from the second segment, which is constricted at the base.

AMPULEX TRIGONA, sp. nov.

Cærulea; antennis tarsisque nigris, femoribus posterioribus rufis; alis fusco-violaceis, nervis fuscis. ♀. Long. 21 mm.

Hab. Khasia (coll. Rothney).

Antennæ stout, shorter than the thorax, black, covered with a pale down; the third joint about one-third longer than the fourth. Head sharply obliquely narrowed behind the eyes; the vertex has a wide shallow furrow in the middle behind, and is sparsely punctured laterally; the front has some elongate foveæ or punctures on the sides; in the centre over the antennæ are some semicircular keels, and one also encloses the front ocellus. The antennal keels are stout, slightly curved, and narrowed at the top; in the middle immediately above them is a distinct black tubercle. The clypeus is sharply keeled throughout in the centre; the apex in the middle roundly and broadly projects, and has on either side a small rounded tooth. The eyes distinctly converge above, and are there separated by about the length of the third antennal joint. Pronotum slightly longer than broad, of almost equal width; in the basal half above is, in the middle, a distinct keel, the space on either side of which is slightly depressed. Mesonotum smooth, the furrows deep; the space between them darker, of a more violaceous hue than the sides. The median segment is transversely striated throughout; the striæ enclosed by the inner keels being more widely separated; and those on the extreme outside are stouter and still more widely separated. All the keels reach to the apex, being united there to a stout semicircular keel; its posterior keel is broadly depressed in the centre. The lower two-thirds of the apex of the segment is closely transversely striated; the upper part has a keel down the middle, and three or four irregular keels on the sides. The spine on the top is stout, narrowed and transverse above; below it is a smaller triangular one. The upper half of the propleuræ is raised, and distinctly separated from the lower; below the middle, on the apical half, are a few stout keels; the upper half of the mesopleuræ bears large deep irregular punctures; the apex of the metapleuræ is striated. Mesosternum with a few scattered punctures; the central furrow moderately wide, and with transverse keels. The anterior trochanters, femora, and tibiæ are reddish in front; the four posterior trochanters and femora are bright red; the hinder claws are stout at the base, and have a stout subapical tooth. The alar nervures are fuscous. Abdomen smooth, the middle purple; the petiole with the narrowed basal part short; the basal part beneath is stoutly transversely striated. The head is more sharply narrowed behind than usual, and the legs have more red.

(To be continued.)

NOTES AND OBSERVATIONS.

FOOD-PLANTS OF THE LARVA OF *CNEPHASIA SINUANA*, Steph. — Mr. Banks's remarks on the food-plants of this species had escaped my eye until the other day, when I was looking over the July number of the 'Entomologist.' He there (p. 194) states that Mr. G. Elisha bred it from spun-up flowers of *Chrysanthemum leucanthemum*, collected in North Kent. If he will turn to the 'Entomologist' for the year 1879 (vol. xii. p. 61) he will there see that Mr. Elisha says: "I have also bred *S. pasivana* (*sinuana*) rather freely the last two seasons from larvæ feeding in the flowers of *Chrysanthemum leucanthemum* . . . various parts of Kent and Surrey." Now the question is, Did he breed *sinuana*, Steph., from this plant at all? Of course *pasivana*, or more correctly *pascuana*, Hüb., is, as everyone knows, a very different species, bearing no resemblance whatever to *sinuana*, Steph., and it *does* feed (as well as upon several other plants) upon the flowers of the "dog daisy." I am aware that for some extraordinary reason Dr. Wocke sank *sinuana*, Steph., as a synonym of "*pasivana*," Hüb.; not by any means the only mistake he made. Possibly Mr. Elisha was using Wocke's name, otherwise surely there must have been some mistake somewhere! There is one great difficulty to get over. If the late Mr. Sang saw the specimens which were bred from *C. leucanthemum* and pronounced them to be *sinuana*, Steph., I of course must bow to his decision, as so good an entomologist could never have mixed up two such very distinct species.—A. THURNALL; "Mascotte," Whitehall Road, Thornton Heath, Sept. 12th, 1902.

NOTE ON *EUZOPHERA PINGUIS*.—On Thursday, August 7th, I was passing (about 8 p.m.) a solitary ash tree about ten minutes' walk from here, and upon glancing at the trunk as I passed was rather surprised at counting thirteen specimens of *Euzophera pinguis* upon it; most of them had only just left the pupa, their wings being held butterfly fashion over their backs. I visited this tree for several successive evenings until the 17th, and never failed to find several on each visit. On two occasions the moths were seen to leave the pupa. After an interval of nearly a fortnight I revisited the tree, and *E. pinguis* was still coming out, but in much smaller numbers, and last evening (31st) I saw one just emerging. In all I boxed forty, and saw quite fifty more out of reach, as they come out late in the afternoon, and very soon run up the trunk, generally well out of reach. How long they had been appearing before the 7th of course I am unable to say, but during the month I think I may say, without much exaggeration, that hundreds must have emerged from this one unfortunate ash!—A. THURNALL; Whitehall Road, Thornton Heath, Sept. 1st, 1902.

ABERRATION OF *VANESSA URTICÆ*.—Miss G. Jeddere-Fisher caught a specimen of *V. urticæ* at East Grinstead, Sussex, on August 28th, 1901. This example is entirely without the two spots on the disc of the wing, and is similar in form to that mentioned in Newman's 'British Butterflies' as the variety *ichnusa* of Bonelli.

ABERRATIONS OF *ZYGÆNA MINOS*.—On June 18th I visited the Welsh locality for the above-named species, and found it in great numbers.

The imagines were just emerging and drying their wings, hanging on to the heather and short herbage. Amongst them was one without any trace of crimson, both upper and lower wings being entirely bronzy black; another specimen had the crimson very much reduced and darkened, whilst three others were decidedly darker than is the usual form.—C. F. JOHNSON; Brinnington Crescent, Stockport.

RAPHIDIA LARVA ATTACKED BY A FUNGUS.—At the Oxshott Field Meeting of the South London Entomological and Natural History Society on Sept. 6th one or two larvæ of *Raphidia*, a neuropterous insect, were found on tree-trunks with abdomen very much distended and pale in colour where the integument was soft enough to distend. On the surface of the glass-tube in which one was placed I afterwards found a multitude of spores, and some of them were evidently germinating. On enquiry at Kew Gardens it was found that the larvæ were attacked by *Empusa lampyridarum*. In conversation with other field entomologists I have heard of similar instances. Probably the wet season is in a large measure responsible for this.—W. J. LUCAS.

PROPOSED ENTOMOLOGICAL SOCIETY IN MANCHESTER.—We are making a strong effort here to form an Entomological Society, and would be pleased to hear from any of your readers who are in any way interested in the movement, and who could assist us in our object.—WALTER E. HARDY; 52, Bedford Street, Moss Side, Manchester, Sept. 8th, 1902.

CAPTURES AND FIELD REPORTS.

CYANIRIS (LYCÆNA) ARGIOLUS IN WESTMINSTER.—I have lately discovered that *L. argiolus* has permanently taken up its abode near Westminster Abbey. During the last day or two I have seen one or two specimens flying round some ivy not fifty yards from that building.—L. A. SPENCER; 52, Burghley Road, Highgate, N.W., Aug. 29th, 1902.

COLIAS EDUSA IN SUSSEX.—One cloudy and very windy day about August 10th, I noticed a specimen of *C. edusa* flying along the downs not far from Brighton. This is the only specimen I have so far seen this year on the wing.—A. W. CARDINALL; 18, Cromwell Road, Brighton.

COLIAS EDUSA IN WALES.—On August 26th, whilst staying at Pwllheli, North Wales, I saw a fine male specimen of *C. edusa*. It was flying close to the sea-shore.—(Mrs.) M. ALDERSON; Park House, Worksop.

COLIAS EDUSA NEAR NORWICH.—On August 16th I saw a male *C. edusa* flying by the roadside about two miles from Norwich, but failed to capture it. Two more were seen near this city on Sept. 6th; and a male was captured near my residence on Sept. 9th.—R. LADDIMAN; 25, Drayton Road, Norwich, Sept. 17th, 1902.

POLYOMMATUS ARTAXERXES, Fabr., IN BANFFSHIRE.—On July 8th last my son and I found this rare butterfly in a valley among the cliffs on the Banffshire coast. As the food-plant of the larva (*Helianthemum*

vulgare) was abundant at the spot, I have been for some time in expectation of getting the butterfly, but I failed till this year. There seemed to be only a few individuals in flight, as we did not see more than two at one time during a whole month.—HENRY H. BROWN; Cupar-Fife.

PYRAMEIS (VANESSA) CARDUI, Linn., AT 1050 FT. IN BANFFSHIRE.—My son captured a specimen of this butterfly beside the cairn on the summit of the Binn Hill at Cullen, Banffshire, 1050 ft. above sea-level, on July 22nd last. It was faded and rubbed, having probably been carried to that elevation by a high wind, although it is not easy to account for the vagaries of *cardui*.—HENRY H. BROWN; Cupar-Fife.

STAUROPOUS FAGI AT MICKLEHAM.—On July 27th last, after a poor day's collecting, I took a fine female specimen of the above species resting on the trunk of a beech tree about ten feet from the ground. It was quite perfect, and I think had not been out of the pupa more than a day.—E. C. GOULTON; 4, Carnford Grove, Balham.

APAMEA OPHIOGRAMMA AT BALHAM.—On August 26th last I took a worn specimen of this insect at electric light in the town. Although I have kept a good look-out, it is the only one I have seen, and should like to know if any others have been taken here.—E. C. GOULTON; 4, Carnford Grove, Balham. [See report of S. Lond. Ent. and Nat. Hist. Soc., Aug. 28th, published in this number.—ED.]

DICYCLA OO IN KENT.—I took a fine specimen of this species on a gas-lamp near Chislehurst towards the end of June last.—G. B. BROWNE; 43, Southbrook Road, Lee, S.E., Sept. 17th, 1902.

PRIONUS CORIARIUS IN BERKSHIRE AND IN HERTFORDSHIRE.—On August 26th last Mr. W. H. Warner, of Fyfield, near Abingdon, sent me, for identification, a specimen of this somewhat uncommon beetle, which he had found on the 21st of the month "crushed and lying on a path in a neighbouring wood." I may mention that in 1893 I captured an example of this species as it was flying across a pathway on Batchworth Heath in Hertfordshire.—RICHARD SOUTH; 96, Drakefield Road, Upper Tooting, S.W.

BLATTA AUSTRALASIE IN SOUTH DERBYSHIRE.—A cockroach forwarded to me by Mr. Hugo Harpur Crewe from South Derbyshire proved to belong to this species. Enquiries kindly made for me by Mr. Harpur Crewe show that it has been established for the last five years, and that it first made its appearance in a greenhouse where some orchids were unpacked which were received from Queensland in 1895.—FRANCIS C. R. JOURDAIN; Clifton Vicarage, Ashburne, Derbyshire.

ODONATA BRED IN 1902.—From nymphs obtained in Byfleet Canal, and a few from the river at Wye, I bred this year the following species:—Of the Anisopterids, *Æschna grandis* (eight or nine, sexes in about equal proportion), *Libellula quadrimaculata*, *Sympetrum striolatum*; of the Zygopterids, *Ischnura elegans*, *Erythromma nias*, *Enallagma cyathigerum*. The greater number of the Zygopterid nymphs turned out to be *Erythromma nias*; nearly all the Anisopterids were of the family *Æschnidæ*, and all of these of the species *Æschna grandis*. The first *Æ. grandis* imago appeared in the earlier part of

July, the latest in the last week of August—an isolated case long after all the other nymphs had duly accomplished their last transformation. It is a curious thing that every *Æschnid* nymph I have obtained from Byfleet Canal during the last three years has proved to be *Æ. grandis*. Some, it is true, have come to a premature end before emergence, and I could not say certainly that they were *grandis*, but I have very little doubt that they were. Can anyone explain why the nymphs always turn head downwards to devour any prey they may have caught? and why the head of the empty nymph-case after the emergence of the imago is invariably inclined to one side, and (from my observation) usually to the right?—HAROLD HODGE; 9, Highbury Place, London, N.

LESTES DRYAS AT HANWELL, MIDDLESEX.—During July of the present year I was delighted to discover a large colony of *Lestes dryas* at ponds near Hanwell, in Middlesex. The males were abundant, but females were not so common. During last winter the ponds were absolutely dry; so, apparently, the nymphs must have burrowed down into the mud during that season. The species was about from July till the first week in August, but was over by the end of the latter month. Points of distinction from the common *Lestes sponsa* will be found in the bronze spot on the dorsal surface of the first segment of the abdomen, and in the shape of the anal appendages of the male—these in addition to the much bulkier and heavier appearance of the better insect. The distinguishing points are figured in Lucas's 'British Dragonflies,' pp. 230 and 234.—S. W. KEMP; Notting Hill, Sept. 2nd.

THE LARGE EARWIG, LABIDURA RIPARIA, AT POKESDOWN.—Major Robertson has shown me a female of this scarce insect, taken by his daughter, Miss Nellie Robertson, at Bournemouth, on July 17th last. I understand that others have been taken this season. It would be interesting if those who have taken the insect during late years would record their captures, so that its position as a British insect might be better understood.—W. J. LUCAS; Kingston-on-Thames, Sept. 8th.

ERYTHROMMA NAIAS IN BERKS.—Mr. W. Holland took a male of this local dragonfly during the present season at King's Weir on the Upper Thames.—W. J. LUCAS; Sept. 1902.

LESTES DRYAS AT WICKEN.—On August 12th, 1901, Mr. A. H. Hamm took a male of this scarce dragonfly at Wicken Fen. It was undetected at the time of capture amongst the common *Lestes sponsa*.—W. J. LUCAS; Sept. 1902.

EUPITHECIA JASIONEATA IN NORTH WALES.—I have to record *Eupithecia jasioneata* from two localities on the Welsh coast. I found the larva sparingly last August in Carnarvonshire, and also noticed it in some flower-heads of *Jasione montana* sent me by a friend from the neighbourhood of Barmouth.—J. E. R. ALLEN; Enniskillen.

PSAMOTIS PULVERALIS IN SURREY.—I am very pleased to add this species to the list of Lepidoptera occurring in the county of Surrey. I took one example last August in the Ockham district.—RICHARD SOUTH; 96, Drakefield Road, Upper Tooting, S.W.

NOTES ON LEPIDOPTERA IN AUGUST.—On August 1st I visited Enfield Lock with the intention of getting a number of larvæ of *Saturnia*

pavonia. Two years ago one could have brought away four or five hundred without difficulty—I am afraid this fact was only too well known to entomologists; now it would be hard to find twenty. Judging from the empty cocoons, *Gastropacha quercifolia* and *Odonestis potatoria* are becoming more numerous in this district. At indoor light at Chingford the following were taken:—*Zeuzera asculi*, *Cerura bifida*, *Pterostoma palpina* (several), *Notodonta dictæa*, *Stilpnolia salicis* (abundant), *Porthesia auriflua*, *Mitochrista miniata*, *Philea irrorella*, *Arctia caia*, *Spilosoma menthastri* (a nuisance), *Gastropacha quercifolia* (one spoilt), a worn-out specimen of *Cymatophora ocularis*, *Hydræcia micacea*, *Axyilia putris*, *Xylophasia rurea*, *Xylophasia polyodon*, *Dipterygia pinastri*, *Agrotis puta*, *Mania maura*, and many other common Noctuæ. All these were taken during the first fortnight of August—not a bad product for a London suburb! Sugaring seemed altogether a failure, and there was apparently little worth netting in the Epping Forest district. Some worn-out specimens of *Cossus ligniperda* were brought to me, but this latter moth is one of the commonest in this district. Chisel a little in the willow-trees in June and you may obtain as many pupæ as you wish. The latter, I may mention, are extremely easy to keep. Larvæ of the “kittens” were common enough, but I have seen not a sign of *Cerura vinula* in any state this season. At Dawlish, during the second and third weeks of August, *Callimorpha hera* was abundant. I did not see another collector all the time I was in the district. The weather was charming, and the return of insects was equally so. Pupa-digging is not much patronized in August—why I do not know; I have always found it most productive. I obtained about a dozen *Amphidasys strataria* (it was rather early for the species, however). I could have taken home a large number of *Agriopsis aprilina*, or of the Tæniocampidæ. *Cerastis vaccinii* and *C. ligula* (*spalicea*) were in force. Two pupæ of *Ennomos tiliaria* and one of *Acronycta alni* were found under bark of willow, and one of the *E. tiliaria* has since emerged. A pupa of *Notodonta dromedarius* should be mentioned. Altogether I procured five hundred and ninety-three pupæ, to more than half of which it would be difficult to assign the right names. In August, 1900, I obtained over two hundred pupæ at Lyndhurst, and I scarcely knew the name of one, but there emerged a lot of very good things, well worth the trouble of digging.—STEPHEN GRAHAM; Chingford, Essex.

A FORTNIGHT AT DEAL.—In the course of a fortnight’s holiday at Deal, commencing with August 10th, I found the moths at night-time extremely abundant on the sand-hills. I put up at Martinsfield, between Deal and Sandwich, and had therefore a fine opportunity of night work in this locality. The garden at Martinsfield was surrounded by a privet-hedge in full bloom, and simply swarmed with life by day and night. I found treacling in this garden gave the most remunerative results, the moths coming in large numbers nearly every night to the posts and trees I had selected; at one time I counted over thirty insects on one patch alone, and it was amusing to watch them struggling for the sweets I had provided. The specimens of *Xylophasia polyodon* were particularly pugnacious and a great nuisance, as they doubtless drove away some of the rarer sorts. The following were in abundance and great variety:—*Agrotis obelisca* (by far the most

numerous), *A. velligera*, *A. puta*, *A. exclamationis*, *Apamea gemina*, *A. oculatea*, *Hydræcia nictitans*, *Triphæna pronuba*, *T. orbona*, *Mamestra brassicæ*, *X. polyodon* (fine light and dark varieties), and *Noctua xanthographa*. Among the others less numerous were:—*Miana literosa*, *M. furuncula*, *Noctua c-nigrum*, *N. baia*, *Acronycta rumicis* (three), *Amphipyra tragopogonis*, *Noctua suffusa*, *Agrotis corticea*, *T. interjecta* (two), *T. fimbria*, *Calymnia trapezina*, *Leucania impura*, *L. pallens*, *L. obsoleta* (two), *Phlogophora meticulosa*, *Xylophasia sublustris* (one), *Luperina testacea*, *Cossus ligniperda* (one), *Mania maura*, and *Leucania lithargyria*. In the privet-hedge *Plusia gamma* swarmed, and examples of this species also came to light in such numbers that they were quite a nuisance in the music-room on the lawn. There were also several locusts in the hedge, and one came to the treacle. Thinking that the season for *Callimorpha dominula* was over, I did not work especially for this species, but I was fortunate enough to capture one in the garden during the day in fair condition. I also took by day *Acidalia emutaria* (one), *Zygana filipendulæ* (very numerous), *T. interjecta* (one); and at dusk, *Porthesia auriflua*, and one *Eremobia ochroleuca* in fine condition. Among the butterflies here were—*Pyrameis cardui*, *P. atalanta*, *Vanessa urticæ*, *V. io*, *V. polychloros*, *Chrysophanus phlaas*, *Pararge megæra*, *Epinephèle ianira*, *E. tithonus*, *Cænonympha pamphilus*, *Lycæna agestis*, *L. alexis*, *L. argiolus*, *Pieris brassicæ*, *P. rapæ*, and *Hesperia linea*, but, as a whole, day-collecting was not propitious; the hours of sunlight were few and far between, and when the sun was shining the wind was cool and rather high, and suggestive always of rain blowing up. In fact, the only ideal day was the one on which I came away, and I was then too busy packing up to be able to take advantage of it. In the few opportunities I had of exploring the country round about on my bicycle, I saw several *Colias edusa*, and captured seven, five in fine condition, but *C. hyale* was not apparently about. I also took four more *Eremobia ochroleuca* on some thistle-heads in a lane near Sandwich. *P. cardui* were also very abundant in the same spot, and indeed all about that neighbourhood, and I captured as many perfect insects as I wanted. I found *Melanargia galatæa* plentiful near Folkestone, and also took one *Aspilates gilvaria* there. I went down and returned from Deal on my bicycle by way of Dover, Folkestone, Hythe, and Ashford, but had little opportunity of doing any collecting on the road, as the weather during the two journeys was most unfavourable. I slept at Dymchurch, near Hythe, on the outward journey, and did a little dusking there, with the result of capturing *Cleora lichenaria* (three), *Lithosia molybdeola* (two), and *C. phragmitidis* (one). *Abraaxas grossulariata* were flying about here in the bushes in large numbers. It will be observed that nearly all my insects were taken in the garden at Martinsfield, and, considering the poor success I had had at sugar all the season up to this fortnight (I treacled in the New Forest for seven nights in early July, with the result of two insects), the few days I spent at Deal were quite a revelation to me. Too many insects at a time (especially to a novice) have certain drawbacks, and I have little doubt that my list of captures could have been largely extended had I not been only a comparative beginner, as I must have passed over many varieties that a more experienced eye would have readily detected.—G. B. BROWNE; 43, Southbrook Road, Lee, S.E., Sept. 17th, 1902.

SOCIETIES.

SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY. — *July 10th, 1902.*—Mr. F. Noad Clark, President, in the chair.—The President, in a few sympathetic words, referred to the sudden death of Mr. Mark Winkley, an old member, and until recently a regular attendant at both ordinary and field meetings.—Mr. West (Greenwich) exhibited the following Hemiptera taken by Mr. Ashby at Deal during the last week in May and the first week in June:—*Podops innuncta*, *Sciocoris cursitans*, *Rhyparochromus chiragra*, *R. pratextatus*, *Trapezonotus agrestis*, *Macrodera micropterum*, and *Plinthisus brevipennis*.—Mr. Ashby, several species of Coleoptera he had taken on the Deal sand-hills in June, including *Zabrus gibbus*, *Saprinus virescens*, *Melanotus punctolineatus*, *Chrysomela distinguenda*, and *Apion sedi*.—Mr. West, a piece of amber from Maldon, found some forty feet below the surface. There were numerous insects imbedded in it, and, from there being no smell of pine when rubbed, he thought it was not true amber, but gum animi.—Mr. MacLachlan communicated a note on *Cotyledon umbilicus*, pointing out its occurrence at Winchelsea and other places in Kent.—Mr. Step read a short report of the Field Meeting at Ranmore Common on June 7th, 1902, and regretted the unfavourable weather which the nineteen who attended had to endure.

July 24th.—The President in the chair.—Mr. F. M. B. Carr exhibited twelve varieties, and the male parent of *Amphidasys betularia*, bred from ova deposited by a black female, taken in cop. at Lee in 1901.—Mr. Kemp, a series of *Læmostenus complanatus*, a species new to the British list, nearly related to *Pristonychus terricola*, and taken by him near Dublin. He also showed *Carabus clathratus*, *Pelophila borealis*, *Blethisa multipunctata*, *Chlænium nigricornis*, dark *Pterostichus cupreus*, *Bembidium bipunctatum*, *Calambus quinque-lineatus*, *C. novemlineatus*, *Orectochilus villosus*, and *Rhopalomesites tardyi* from Lough Neagh, together with *Bembidium argentiolum*, a recently added species, also from Lough Neagh. From near Dublin he showed *Phytosus balticus*, *Diglossa mersa*, yellow *Cercyon littorale*, *Saprinus maritimus*, *Telephorus darwinianus*, *Cillelus lateralis*, *Polydrusus chrysomela*, *Hydroporus* several species, *Silpha atrata* and var. *subrotundata*, *Hæmonia appendiculata*, *Chrysomela banksii*, *Barynotus schönherri*, *Meloe violaceus*, and a series of the purely Irish *Otiorrhynchus auropunctatus*.—Mr. Kemp, a series of the rare *Lestes dryas* from Hanwell, with *L. sponsa* for comparison.

August 14th.—The President in the chair.—Mr. Edwards exhibited ova of *Anthrocera trifolii* from Byfleet.—Dr. Fremlin said that, during a recent visit to the Isle of Man, he had taken *Dianthæcia cæsia* and larvæ of *Polia xanthomista* var. *nigrocincta*.—Dr. Chapman, specimens of *Neuroptera bipennis* (*lusitanica*) from Bajar, in Spain.

August 28th.—Mr. E. Step, Vice-President, in the chair.—Mr. E. J. Riley, of 94, Drakefield Road, Upper Tooting, was elected a member.—Mr. South exhibited a series of *Apamea ophiogramma*, bred from larvæ taken in his garden at Tooting.—Mr. Turner, a short series of *Agrotis ripæ*, bred at the end of June, 1902, from larvæ taken in August, 1901, at Dawlish. The variation was very considerable, from very snowy forms to an exceedingly dark example.—Mr. Bowman, a large number

of species of the genus *Erebia*, including series of *E. zapateri*, from Spain, and *E. christi* from Switzerland. He also showed a series of *Melanargia lachesis*.—Mr. South, ova of *Tortrix picana* and *Retinia pinicolana* from Oxshott.—Mr. Adkin, several masses of cocoons of a species of *Apanteles*, which had emerged from the larvæ of *Boarmia gemmaria* in his garden. A discussion ensued as to the cause of the curious curved position of the larval remains over the cocoons.—Dr. Chapman, a specimen of *Scoliaula* (*Bohemannia*) *quadrinaculella* from Reigate.—HY. J. TURNER (*Hon. Rep. Secretary*).

RECENT LITERATURE.

W. F. JOHNSON and J. N. HALBERT. "A List of the Beetles of Ireland." 1902. Proc. Roy. Irish Acad. (3), vi., pp. 535-827, and 1 map.

It was but a few months ago (Entom. 1902, pp. 54-6) that we hailed the termination of Mr. Kane's 'Catalogue of Irish Lepidoptera,' and we have now to welcome a similar summary of our knowledge of the Coleoptera. A number of local records and partial lists have been published since the days of Haliday, the father of Irish entomologists, in 1828, but Johnson and Halbert are the first to present us with a complete list, a large proportion of the records, indeed, having been made by these author's themselves.

In noticing Kane's work, we briefly summed up the views upon the Erse Fauna held by various specialists in geographical distribution, and these remarks naturally apply also very largely to the beetles.*

Some 1630 species are enumerated, a little less than half the total British Coleopterous Fauna; of these some forty are noted as having been probably introduced more or less recently. There are no species certainly peculiar to Erin, though one form (*Silpha atrata* var. *subrotundata*) occurs in the Isle of Man, but not on the Continent, and has been recorded only very doubtfully from England. There are, however, five species of European distribution not yet found in England—viz. *Dyschirius obscurus*, *Stenus argentellus*, *Bembidium argentiolum*, *Xantholinus cribripennis*, and *Otiorrhynchus auropunctatus*, the last three being recorded for the first time as British.

In the Bibliographical List there are cited fifty-five authors who are responsible for nearly 250 papers and isolated records of Irish beetles. This work, accompanied as it is by notes of capture, &c., of the rare and local species, must prove of high value to the working coleopterist. We believe that the authors have also devoted considerable attention to the Rhynchota, and we hope that they will before long produce a similar account of that highly interesting but sadly neglected order.

G. W. K.

* Led astray by a misprint in Scharff's work, we unfortunately overlooked a suggestive paper by G. H. Carpenter, "The Problems of the British Fauna" ('Natural Science,' 1897, xi., pp. 375-86).

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VARIATION OF *LYCÆNA CORYDON* IN NORTH WILTS.

BY THE REV. C. A. SLADEN.

THIS species—the “chalk-hill blue,” as it is commonly called—occurs in profusion on the downs of North Wilts. Here about harvest-time the foot of the downs, where the turf ends and cultivation begins, is red with the flowers of the knapweed (*Centaurea*), or “hardhead,” as it is sometimes locally called; and on the flowers of this plant *L. corydon* swarms in countless numbers, fighting its fellows for standing room, or expanding its wings to the sun.

In this neighbourhood it varies little in size, though I have occasionally caught little dwarfs of less than an inch in wing-expanse, and other fine fellows of over $1\frac{1}{2}$ in.

The male varies little in colour, but the female varies much; and this applies both to the upper and the under side.

Upper side, male type.—Silvery blue, sometimes with black discoidal spot on fore wings:—

1. With broad black hind margin.
2. With narrow black hind margin.
3. With spotted black hind margin.

In this latter the ocellated spots of the under side show through the hind marginal band on the upper side. The extreme form of this variety has a row of white spots along the hind margin, the black border disappearing. Sometimes specimens occur with the ocellated spots on the hind margin of the hind wings tinged with orange, as in the female.

All these variations are mentioned by Mr. South in his notes on the genus *Lycæna* in the ‘Entomologist,’ vols. xx. and xxxiii., var. 3 being figured on Plate I., fig. 9, in the former volume, and the extreme form of it in Plate III., fig. 5, in the latter.

Upper side, female type.—Brown or black-brown, with black discoidal spot on fore wings, sometimes also visible on hind wings, and with more or less distinct hind marginal row of orange ocellated spots on hind wings :—

1. Variegated with white.

(a) Discoidal spots edged with white.

(b) Hind wings with one or sometimes two interrupted rows of white spots or dashes between the hind margin and base of the wing.

2. Variegated with blue.

(a) Hind wings with blue spots or dashes, sometimes wholly blue ; the fore wings also less commonly with spots or dashes of blue, and sometimes with a central splash of blue, the distribution of colour in this latter case resembling that of dark forms of *Lycæna argiolus*. This form, though apparently not uncommon elsewhere, I have not come across here before this year.

(b) All the wings blue as in the male, but of a richer colour, with or without black discoidal spots, the black hind margin varying in width, as in the male, but always with orange ocellated spots along hind margin of hind wings, as in typical female. This is the variety *Syngrapha*, and it is figured in Dr. Lang's 'Butterflies of Europe,' plate xxvi. fig. 7. I found this variety here first in 1870, though it no doubt occurred here before my time ; but I have only lately tried to obtain a series. Last year, when there was favourable weather, while *L. corydon* was on the wing, I caught thirty specimens of this variety ; this year, in unfavourable weather, I only obtained twelve.

One female caught last year is a small specimen with blue fore wings, and hind wings normal, with few blue scales, reversing the ordinary course of variation in this species. One female caught this year has the veins of the hind wings blue, the intervening spaces being normal colour. In the usual form of partial blue variation the veins remain black, while the intervening spaces are blue. Another female caught this year is of a dull black colour, with white-edged discoidal spot on fore and hind wings, and with indistinct greyish dashes from the hind margin to the base of hind wings. The under side of this specimen is creamy white, wanting the basal spots on fore wings, and several of the spots on hind wings, the other spots, though reduced in size, showing up very distinctly against the light background.

Under side, male.—This does not vary much as to the number of spots, though the spots often vary much in size. Occasionally some of the spots are duplicated, occasionally some are confluent. The variety without basal spots on the fore wings is not uncommon, and the discoidal spot on the hind wings often lacks the black centre.

Under side, female.—The spots vary much both in size and number. An extreme specimen has only discoidal spot on the hind wings, the basal spots being absent on the fore wings, and the row of spots inside the hind marginal row being also very small and indistinct. I have many varieties leading up to this. The ground colour of the under side varies from dark brown to pale or yellowish brown, and on the fore wings to almost white, the white form of under side generally coinciding with variation of colouring of the upper side.

Alton Barnes Rectory, Wilts: Sept. 30th, 1902.

THE NORTH STAFFORDSHIRE FORM OF *ZONOSOMA* (*EPHYRA*) *PENDULARIA*.

By F. C. WOODFORDE, B.A., F.E.S.

THE object of this paper is to call attention to a remarkable form of *Zonosoma pendularia*, which appears to be confined to a very small area in North Staffordshire. The typical form of this species has a very pale, nearly white, ground colour, which makes the insect almost indistinguishable when sitting on the white stems of birches. In the variety under consideration the ground colour is a slaty grey, rather closely approaching that of *Z. orbicularia*, while the whole of the centre of the wing is filled up with a rosy pink. This rosy coloured portion has no clearly defined edges, but merges gradually into the ground colour. It is very difficult to describe colouration of this sort where the colours are thus suffused, so as to convey a clear idea of the object under description; and the Editor, to whom I sent some specimens, has kindly promised to include figures of one or two of them in the next coloured plate of varieties published in the 'Entomologist.'

The habit of most of the species of the genus is to sit during the day on leaves, and, although I have often seen *Z. punctaria* sitting on the trunks, yet I have obtained far more by beating the bushes. *Z. porata* and *Z. annulata* (*omiconaria*) seem always to choose a leaf for a resting-place; *Z. pendularia*, on the contrary, as far as my experience goes, seems always to rest on the stems, generally of small birches, but not unfrequently on the trunks of oak-trees. Very few of the birch-stems in this district of North Staffordshire are white, by far the larger proportion being reddish brown, mottled with dark green by lichens. On such a stem the type-form, which is almost invisible on the white birch-trunks of the New Forest, would stand out most conspicuously; whereas the form under consideration is extremely hard to see, even when one is close, and looking at the very spot

where the insect is sitting. Forms approaching the typical occur here, but the palest is greyer than the type, and individuals of the darker forms are more numerous than representatives of the pale one.

It would appear therefore that this aberration from light to dark is a change brought about for protection, the conspicuous pale form having gradually developed into the very inconspicuous dark one.

Mr. Barrett, in his great work, figured a specimen that I sent him for that purpose, with a very similar but darker form of the same aberration from Mr. Webb's collection; but the locality from which this latter specimen came is not given. After numerous inquiries I cannot discover that anyone has ever seen or heard of this peculiar form occurring in any other locality, though my inquiries extended even into Germany.

Such a distinct and remarkable variety seems to deserve a distinctive name, so I propose naming it *Z. pendularia* var. *subroseata*.

Market Drayton: October, 1902.

ON THE BUTTERFLIES COLLECTED IN EQUATORIAL AFRICA BY CAPTAIN CLEMENT SYKES.

BY EMILY MARY SHARPE.

[My journey into the interior of Africa I commenced early in 1898. Starting from Mombasa in the train, which in those days only took one 120 miles, I soon got to Kebwezi and Nairobi. Both these places were excellent haunts for the entomologist, and I much regret that I did not embark on making a collection of Lepidoptera and Coleoptera until the time came for my return. Alas! I found myself steaming through these places in 1900 in a train, and my opportunity had gone.

I commenced my collection about July, 1899, when I was at a place called Lamogi, in the valley of the Upper Nile, close to Baker's old fort of Fatiko. Though there are woods in those regions, there is little or no forest, and butterflies were rather scarce. The Nymphalidæ were principally represented. In December, 1899, I journeyed to Wadelai, which is a far drier and sandier place, and there the Pieridæ were fairly prolific. More especially did *Teracoli* abound in great numbers and varieties. Near the sandy banks of the Nile I could always catch as many as I wanted. But the Nile District is a disappointing country for the entomologist, who would naturally expect many new species in such little frequented regions. In

March, 1900, I began my return journey to the coast, and commenced then to work more seriously. Had I known earlier in my career how easily butterflies are sent home, and in what good condition they arrive, I should have sent many thousands more than I did. As it was, I waited until I could bring them to the coast personally, fearing to trust the fruits of so much labour to the tender mercies of the various savages through whose hands they would have to pass.

Through Unyoro I collected a fair number, in the swamps, of the *Nymphalidæ* and *Acræidæ*, and on entering Uganda proper, the wooded dells, fringed with swamps, afforded opportunities for considerably increasing the collection, especially amongst the *Hesperidæ*. During the evening and at night it was my custom to sit with one end of my tent open, and two lights burning. As the moths came towards and around the light, I watched my opportunity, and directly they were stationary I pressed them to death with the handle of a spoon or fork, having no killing-bottle. I found this possible without doing any appreciable damage to the scales of the specimens. I thus got all the *Hesperidæ* and *Noctuidæ* in the collection.

All the wooded shores of the Victoria Nyanza are admirable hunting-fields, and I have seldom seen such a sight as the butterflies on the shore opposite Lubwa, where an arm of the lake forms an exit for the old river Nile. The steep hill overlooking an exquisite view was ablaze with their colours, and I stood for many hours netting as hard as I could.

Passing through Usoga and Kavirondo, I encountered a famine, where dead bodies of natives and animals lay at frequent intervals in the pathway. Over these hideous objects beautiful butterflies hovered, and it seems strange that nature should give such repulsive food to perfect works of her art. Then I came to the great primæval forest of Nandi, and within its depths the species of *Charaxes* seek the many putrefactions which are always to be found amongst trees and damp heat. As they shake and quiver over some filthy morsel they gradually make themselves drunk, and fall easy victims to the collector. Some enthusiasts hang up putrid meat and carcasses to attract these foul feeders, but if forest is near this is unnecessary. It is practically the only way to catch all those butterflies that have a strong flight.

And so I finally got to the train and reached the coast. I could not take the collection home myself, as I had to hurry off to the war; but I carefully put the specimens in paper "envelopes," these into biscuit tins, and these again into airtight tin uniform cases, with plenty of naphthaline, and packed them off by sea to England, where they arrived in a most satisfactory state.—C. A. SYKES, Capt. R.H.A.]

Family DANAIDÆ.

1. TIRUMALA PETIVERANA (*Doubl. & Hewits.*). — *a*, ♂. Usoga; April, 1900.
2. DANAIS CHRYSIPPUS (*Linn.*). — *a*, ♂. Lamogi; November, 1899. *b*, ♂. Wadelai; January–March, 1900.
3. D. ALCIPPUS (*Cram.*). — *a*, ♂. Wadelai; January–March, 1900.
4. D. KLUGII (*Butl.*). — *a*, *b*, ♂. Wadelai; January–March, 1900. *c*, ♀. March from Usoga to Nandi; April, 1900.
5. D. DORIPPUS (*Klug*). — *a*, ♀. March from Usoga to Nandi; April, 1900.
6. AMAURIS DAMOCLES (*Paillet de Beauvois*). — *a*. March from Usoga to Nandi; April, 1900.
7. A. ENCELADUS (*Brown*). — *a*, ♂. March from Usoga to Nandi; April, 1900.
8. NEBRODA ALBIMACULATA (*Butl.*). — *a*, *b*, ♂ ♀. March from Usoga to Nandi; April, 1900.

Family SATYRIDÆ.

9. MELANITIS LEDA (*Linn.*). — *a*, ♂. March from Usoga to Nandi; April, 1900.
10. MYCALESIS FUNEBRIS (*Guén.*). — *a*, *b*, ♂ ♀. Wadelai; January–March, 1900. *c*, ♀. March from Usoga to Nandi; April, 1900.
11. M. DESOLATA, *Butl.* — *a*, *b*, ♂ ♀. Lamogi; November, 1899.
12. M. ANGULOSA, *Butl.* — *a*, ♂. March from Usoga to Nandi; April, 1900.
13. M. PERSPICUA, *Trimen.* — *a*, ♂. March from Usoga to Nandi; April, 1900. *b*, ♀. Unyoro; March, 1900.
14. M. MIRIAM (*Fabr.*). — *a*, ♂. Wadelai; January–March, 1900.
15. M. SAUSSUREI, *Dewitz*, — *a*, *b*, ♂ ♀. March from Usoga to Nandi; April, 1900.
16. APHYSONEURA PIGMENTARIA, *Karsch*, *Ent. Nachr.* xx. p. 191 (1894). *Rhaphiceropsis pringlei*, E. M. Sharpe, *P. Z. S.* 1894, p. 336, pl. 19, figs. 1, 2. *a*. March from Usoga to Nandi; April, 1900.
17. YPTHIMA ALBIDA, *Butl.* — *a*. March from Usoga to Nandi, April, 1900.
18. Y. PUPILLARIS, *Butl.* *a*. Wadelai; January–March, 1900.
19. Y. ASTEROPE (*Klug*). — *a*, ♂. Lamogi; November, 1899.
20. Y. ITONIA, *Hewits.* — *a*, *b*. Lamogi; November, 1899.

Family ACRÆIDÆ.

21. *ACRÆA SERENA* (Fabr.).—*a*, ♂. Lamogi; November, 1899.
b, ♀. March from Usoga to Nandi; April, 1900.

22. *A. VINIDIA*, Hewits. *a*, *b*. Unyoro; March, 1900.

23. *A. BONASIA* (Fabr.).—*a*, *b*. Wadelai; January–March, 1900. *c*. March from Usoga to Nandi; April, 1900.

24. *A. ALICIA*, E. M. Sharpe.—*a*. March from Usoga to Nandi; April, 1900.

25. *A. SYKESI*, sp. n.—Allied to *A. atergatis*, Westwood, and *A. gaekwari*, E. M. Sharpe; but is distinguished from the former by the much darker ground colour, and from the latter species by having no transparent patch on the primaries.

Primaries: Ground colour light chestnut-brown, the nervules black, the costa, apex, and hind margin narrowly edged with black, the cilia white; the spots, which are all black and well defined, are situated as follows: two in the discoidal cell, and one at the end of the cell; just beyond this a transverse band consisting of five spots between the nervules, the first four being all united; two small spots above the submedian nervure, and one somewhat larger between the first and second median nervules; near the hind margin a row of black streaks situated between the nervules, commencing above the submedian nervure; the basal area suffused with brownish black. Secondaries: The ground colour somewhat pinker in tint than that of the primaries; a distinct black border on the hind margin, the cilia white, the base dusted with black, and having three distinct black spots; an uneven row of small black spots crossing the discal area, each spot situated between the nervules, which are not black as in the fore wing. Under side: Ground colour much lighter, the apical area being paler; all the black spots and markings as on the upper surface, the hind marginal border being very narrow; near this border, situated between the nervules, are seven ochraceous coloured spots or streaks, the second one from the costa extending almost to the black transverse band on the upper side. Secondaries pale in colour, the whole of the basal area thickly spotted with black, and also showing some pink spots; the black hind marginal border relieved by half-circles of yellowish-white spots. Expanse, 2 in. Wadelai; January–March, 1900.

Female.—General colour of both wings more tawny brown, the black spots on the primaries similarly situated as in the male, but larger, the submarginal row of streaks being more suffused; beyond the black band, on the apical side, a paler band is indicated. Secondaries lighter in colour, the black spots larger, and the hind marginal border broader. Under side agreeing exactly with that of the male above described, the pink spots on the secondaries having faded to a more ochre-yellow.

Expanse, 2·3 in. (Spec. ex White Nile. Consul Petherick; Mus. Brit.).

The collection in the Natural History Museum contains two males from Wadelai (collected in the months of March and April, 1887, by the late Emin Pasha), and the female above described, from the White Nile.

26. *A. CABIRA*, Hopff.—*a*. March from Usoga to Nandi; April, 1900.

27. *A. DICE*, Drury.—*a*. Wadelai; January–March, 1900.

28. *A. INSIGNIS*, Distant.—*a*. March from Usoga to Nandi; April, 1900.

29. *A. PENELEOS*, Ward.—*a-c*. March from Usoga to Nandi; April, 1900.

30. *A. POMPONIA*, Grose Smith.—*a*. Unyoro; March, 1900.

31. *A. NEOBULE*, Doubl. & Hewits.—*a*. March from Usoga to Nandi; April, 1900.

32. *A. PUDORINA*, Staud.—*a*, ♂. March from Usoga to Nandi; April, 1900.

33. *A. NATALICA*, Boisd.—*a-c*, ♂. March from Usoga to Nandi; April, 1900.

34. *A. CÆCILIA* (Fabr.).—*a-c*, ♂ ♀. March from Usoga to Nandi; April, 1901. *d*, ♂. Wadelai; January–March, 1900.

(To be continued.)

MISCELLANEA RHYNCHOTALIA.—No. 5.

By G. W. KIRKALDY, F.E.S.

Fam. GERRIDÆ.

HYDROMETRA AGENOR, sp. nov.

Brownish castaneous, a narrow median longitudinal very pale bluish grey line on pronotum, apical margin of pronotum black. Antennæ (except pallid base of first segment), apex of head, &c., black. Abdomen above shining black, connexivum flavo-stramineous, extero-lateral margin narrowly black. Abdomen beneath pale flavous, except the dark genital segments. Legs pale flavo-fuscous, tarsi and apices of femora and of tibiæ black. Elytra lurid, nervures black. Rostrum reaching to eyes, but not beyond; antennæ equal to about two-thirds of insect's length; antecular part of head more than twice as long as the postocular; head somewhat dilated at apex, scarcely so at base; antecular part of head four times as long as first segment of antennæ, third more than twice as long as the fourth, four times as long as the second, which is two-thirds longer than the first. Apex of anterior femur scarcely reaching to apex of head. ♂. Long. 13½ mill.

Hab. ECUADOR, Guayaquil (colln. Montandon).

Allied to *H. caraiba*, Guérin, but separable by the proportions of the antennæ, &c.

HYDROMETRA NAIADES, nom. nov.

= *H. mensor*, Champion, nec White.

Besides unimportant colour differences, Champion mentions "anteocular portion (of head) about twice as long as the post-ocular portion," while White describes *H. mensor* as "anteocular part not quite once and a half as long." As this proportion of the head is one of the most important characters in the specific differentiation of *Hydrometra*, it is impossible, at present at least, to retain the name *mensor* for Champion's species. White's type is unfortunately lost or destroyed, as is also that of *H. metator*.

RHEUMATOMETRA, gen. nov.

Allied to *Kallistometra*, Kirk., and *Halobatopsis*, Bianchi, but differing by the proportions of the antennæ, legs, &c.

Suboval; antennæ short, subequal to the pronotum in the winged form; first segment shorter than the other three together, fourth fusiform, one-fourth longer than the third. Apical segment of anterior tarsi three or fourth times as long as the basal; posterior femora a little longer than tibiæ and tarsi together; intermediate legs very long, tibiæ longer than femora, which are a trifle longer than tarsi.

Macropterous form: Pronotum slightly convex, rounded posteriorly. Elytra long, extending far beyond apex of abdomen.

Apterous form: Pronotum short, transverse.

R. PHILARETE, sp. nov.*

Velvety black; base of first segment of antennæ, a large spot in the middle of the anterior lobe of pronotum, lateral margins of the nota, the connexivum above, coxæ (in part), &c., bright luteo-flavous. Male anterior femora and tibiæ strongly curved and somewhat incrassate. Female anterior femora and tibiæ only slightly, if at all, curved or incrassate. Long. (to apex of abdomen), ♂ $2\frac{1}{4}$ mill., ♀ $4\frac{1}{2}$ mill.; lat. ♂ $1\frac{1}{8}$ mill., ♀ $2-2\frac{1}{4}$ mill.; long. to apex of elytra, ♀ 6 mill.

Hab. AUSTRALIA, Victoria, Alexandria (collns. Montandon and Kirkaldy).

MICROVELIA STELLATA, sp. nov.

Apparently allied to *M. albonotata*, Champion, but that species is described as not having the vertex longitudinally sulculate, and the colouring is somewhat different.

Elongate. Black; basal half of first antennal segment, basal three-fourths of femora pale flavescent. Anterior margin of pronotum (entirely) fulvous. Antennæ, elytra, and legs dark sienna-brown, the

* I have a revision of the Gerridæ in progress, where these and other forms will be described in more detail.

elytra being largely silvery white basally; there are also seven or eight much smaller silvery spots from base to apex. Beneath black, connexiva fulvous. First segment of antennæ distinctly longer than second, fourth a little longer than third, which is one-fourth longer than second. Pronotum not carinate medianly. Long. $2\frac{1}{5}$ mill.; lat. 0.85 mill.

Hab. ECUADOR, Guayaquil (collns. Montandon and Kirkaldy).

Fam. PYRRHOCORIDÆ.

ASTEMMA (DYSDERCUS) MIMUS (*Say*).

JAMAICA (C. B. Taylor).

Fam. MIRIDÆ.

MAKUA, gen. nov.

Belongs to div. *Capsaria*, Reuter.

Macropterous form: Impunctate, pronotum slightly rugulose. Vertex immarginate, not sulcate. Head strongly declivous, about as long as high; clypeus confluent with the front, but well separated. Rostrum not reaching beyond intermediate coxæ. First segment of antennæ extending well beyond apex of head, distinctly shorter than the pronotum. Pronotal collar shorter than width of second antennal segment at base. Pronotum slightly transverse. Scutellum somewhat convex. Corium without supplementary nervures; cuneus longer than wide at base. Greater membranous areole angulate-rotundate. Posterior femora short, not nearly reaching apex of abdomen, shortly hairy; tibiæ with spiny bristles.

M. PSOLE, sp. nov.

Head, pronotum, scutellum, elytra, connexivum, ventral surface, and legs sordid luteo-testaceous; pubescence whitish. Eyes, two basal segments of antennæ, tarsi, and apex of rostrum blackish. Clavus and corium (interiorly) dark purplish brownish; pronotum laterally smoky. Corium intero-apically sanguineous, membrane dilute smoky, nervures sanguineous. Clypeus and narrow sublateral stripe on sterna sanguineous. Vertex about three-fifths wider than an eye, rounded apically (as seen from above); second segment of antennæ three times as long as first, and twice as long as pronotum (excluding collar). Long. $5\frac{1}{2}$ mill., lat. $1\frac{3}{8}$ mill.

MOZAMBIQUE, Rikatla.

PLEXARIS, gen. nov.

Belongs to *Capsaria*, Reut.

Strongly punctured. Head large, distinctly wider than half the base of pronotum. Vertex immarginate. Eyes not widely divergent apically. Second segment of antennæ slightly incrassate apically. Rostrum not reaching as far as posterior coxæ. Pronotum widely sinuate at the base, latero-posterior angles acute, base nearly four times as wide as the collar, lateral margins straight, widely diverging. Collar very slightly wider than the vertex at base. Scutellum convex.

Cuneus deeply incised, major areole of membrane widely rounded apically. Posterior femora short, not nearly reaching to apex of abdomen; first segment of posterior tarsi distinctly shorter than the second, third the longest.

Allied to *Deracecoris*. Stål, but distinguished by the large head, &c.

P. SATURNIDES, sp. nov.

Suboval; more or less shining black above and below; a triangular spot at base of vertex posterior to eyes, an elongate spot on vertex, middle third of second segment of the antennæ, postero-lateral margins of pronotum, a spot in middle of apical margin of pronotum, and the tarsi testaceous; a longitudinal narrow stripe on middle of basal half of pronotum fulvous. Tibiæ annulate alternately with black and white. Rostrum fusco-testaceous; apically black. Membrane hyaline, with a median curved band and the nervures black. Long. 5 mill., lat. 2 mill.

Hab. NATAL, Howick.

MEGINOE, gen. nov.

Belongs to *Capsaria*.

Subelongate; not (or only superficially) punctured. Scutellum rugose-punctured. Head strongly declivous. Vertex immarginate, very narrowly longitudinally sulcate, a little impressed subtransversely near the base. Clypeus somewhat prominent, not forming a continuous curve with the head. Eyes large, contiguous with pronotum, extending almost to internal margins of rostrum, second as long as high (in profile), posterior margin sinuately emarginate (in profile). Antennæ inserted almost at middle of eye (in profile). First segment of rostrum reaching to about the middle of prosternum, fourth segment extending beyond posterior coxæ. Pronotum one-half wider than head and eyes, base two and three-quarter times as wide as collar; one-third longer than length of head (profile); base subsinuately rounded widely; two small sharply marked rounded tuberculate callosities; lateral margins not reflexed. Collar somewhat narrow. Stink-orifices large, suboval, subauriculate. Major areole of membrane narrowly rounded apically. Cuneus longer than broad at base.

Not very closely allied to any other genus.

M. HOVANA, sp. nov.

Hairy and pubescent. Head pale sordid flavous, multistriate subrotundately, and clouded transversely with sanguineous. Pronotum pale luteo-flavous, mottled with brownish. Two subconfluent dark brown blotches in the middle of the basal margin of the pronotum; callosities black. Three apical segments of rostrum and the stink-orifices testaceous. Scutellum blackish brown, posterior angles pallid. Elytra fuscous, cuneus blackish brown, a broad curved pale yellow band across the middle. Membrane hyaline, fumate, nervures fuscous. Underneath pale fusco-fulvous, darkening laterally. Eyes prominent, each as wide as—or a little wider than—vertex between them. Vertex

(as seen from above) rounded anteriorly. ♀. Long. 7 mill., lat. $2\frac{1}{3}$ mill.

Hab. MADAGASCAR, Diego Suarez.

GUTRIDA, gen. nov.

Belongs to *Capsaria*.

Suboval; glabrous, abdomen above, &c., sparsely pubescent; pronotum and elytra punctured. Vertex marginate. Head vertical, about twice as wide (in profile) as high. Eyes (profile) more than one-half of the length of the head; first segment of antennæ extending beyond apex of head, inserted within the apical margin of the eyes. First segment of rostrum very short, reaching a little beyond base of head. Eyes contiguous with pronotum. Pronotum declivous, not or only very slightly callose anteriorly; base widely rounded (subsINUATELY), more than two and a half times as wide as the length of the first segment of antennæ, about four times as wide as collar, not quite twice as wide as head and eyes together. Lateral margins of elytra a little rounded, apical margin of corium extero-laterally reaching somewhat beyond base of cuneus, the latter a little declivous; membranal nervures angulately rotundate apically. Posterior femora not much stouter than the other pairs. Tarsi with bristly spines.

G. GABONIA, sp. nov.

Head, pronotum, and scutellum flavous, a subbasal elongate blackish brown spot in the middle. Eyes red-brown. Anterior angles of scutellum fumate. Elytra pale sordid yellowish, lateral margins of clavus widely dark, apical margin of corium clouded irregularly with brownish. Base and apex of cuneus blackish brown, membranal nervures fuscous. Head rounded apically (seen from above). Long. 6 mill., lat. $2\frac{1}{2}$ mill.

Hab. GABOON (ex coll. Montandon).

(To be continued.)

NOTES AND OBSERVATIONS.

GONEPTERYX RHAMNI, AB.—Mr. Sabine, of Erith, has kindly sent for inspection an example of *G. rhamni*, which is apparently a female, but the fore wings are tinged with the male colour, especially at the base and on the costal and hind marginal areas; the hind wings are very similar in colour to those of the male. The specimen was taken this year in the New Forest by Mr. L. W. Newman.

LYCÆNA CORYDON AB.—Ground colour of all the wings blackish. Fore wings have a black centred white discal spot and a series of six quadrate white spots on the submarginal area; the latter are dusted with black atoms, especially the lower three of the series, and are traversed by an interrupted, blackish, diffuse line extending from the inner margin to the third spot; the basal and central areas are heavily dusted with blue scales. The markings on the hind wings are some-

what similar to those of the fore wings, but the white spots on sub-marginal area are smaller and not so well defined; marginal spots white with blackish centres. The under surface of all the wings is very like that of a normal male. The specimen was taken at Wrotham in August last by Mr. W. A. Carter, and is now in the possession of Mr. Sabine.

VARIETY OF *VANESSA ANTIOPA*.—One of the imagines resulting from a batch of German larvæ of *Vanessa antiopa* bred by me this season is rather a remarkable variety, of which I can find no mention in my entomological books. On the upper wings there is a complete absence of the blue spots, and on each of the lower wings there is only one small blue spot. The specimen is somewhat smaller than the normal ones of the same brood, and I had noticed a sort of indentation on the wing-cases of the pupa, which led me to fear that the imago might not emerge. However, though it was not the first to pupate, it came through first, on July the 24th, having been sixteen days in the pupa state.—F. A. OLDAKER; Parsonage House, Dorking, Sept. 23rd, 1902.

TYPHLOCYBA COLORADENSIS IN MEXICO.—Dr. Bonansea Silvio has just sent me numerous specimens of this grape-vine leaf-hopper, collected at Ciudad Porfirio Diaz, Mexico. The insect is common in New Mexico, but is, I believe, new to the fauna of Mexico.—T. D. A. COCKERELL; Sept. 16th, 1902.

CAPTURES AND FIELD REPORTS.

COLIAS EDUSA AT BEXHILL.—In August last I took *C. edusa* near Bexhill—one male on the 13th, another male on the 16th, and a male and two females on the 20th.—P. TOWELL; Homesdale Road, Teddington.

COLIAS HYALE AND *C. EDUSA* IN KENT.—As far as I can ascertain, only the early brood (consisting of immigrants) of *C. hyale* has appeared this year at Sheerness, the headquarters of this species. My informant, Mr. E. Griffiths, very kindly sent me all his captures, which amounted to seven specimens, consisting of six males and one female (which proved infertile). These he captured on June 27th, 29th, and July 12th. He now informs me he has not seen one *C. hyale* since the latter date, and that *C. edusa* has been scarce, having only seen ten altogether, three of them in June. The above is interesting, showing how unsuitable a cold English summer is for the existence of these butterflies.—F. W. FROHAWK; October, 1902.

I noticed two specimens of *Colias edusa* at Folkestone in August of this year, on the golf links.—HAROLD HODGE; 9, Highbury Place, N.

While staying at Folkestone the first fortnight of September, I captured a few *Colias edusa*, one var. *helice*, and four *C. hyale*.—W. E. BUTLER; Hayling House, Reading, October 4th, 1902.

COLIAS EDUSA, &c., IN SUSSEX.—My boy caught here, in September last, four male *C. edusa*, in quite fresh condition; also about six *Vansesa cardui*, and four *V. io*, in equally good condition. The latter insect only turns up occasionally here. It has been a very bad year for insects; treacle and light absolutely useless. I collect on my

small estate of four hundred acres, on which are about a hundred acres of wood, chiefly oak. Since I came here, five years ago, my experience has been very disappointing. Both treacle and light seem to be losing their power of attracting. I shall be glad to hear from some of your correspondents, whether they have had a similar experience in other parts of the country. I live about two miles and three-quarters from Hayward's Heath, in a country which looks very suitable for collecting, but I have not found it so. *V. atalanta* has been very scarce this year, as it was last. Two years ago it swarmed.—A. H. RYDON; Awbrook, Lindfield, Sussex, Oct. 4th.

COLIAS EDUSA IN CORNWALL.—I noticed two specimens of *C. edusa* in September of this year, on the West Cornwall golf-links at Lelant, Hayle, Cornwall.—HAROLD HODGE; 9, Highbury Place, N.

SESIA MYOPIFORMIS IN LONDON.—I took a perfect specimen of *S. myopiiformis* in the garden of this house early in June last. There are several pear-trees in the gardens about here, one quite close by of great size and age. But, though I have observed the insects in this garden for over fourteen years, I have never seen *S. myopiiformis* here before.—HAROLD HODGE; 9, Highbury Place, N.

CAPTURE OF *SESIA ALLANTIFORMIS*, NEWM. (= *ANDRENIFORMIS*, Lasp.) IN DORSETSHIRE.—On August 23rd I swept a male of this grand addition to our county fauna at Glanvilles Wootton, off feverfew flowers. This enables me to state that my specimen from the New Forest, recorded as *Sesia conopiiformis* (Entom. vol. xxvii. pp. 245, 342; vol. xxix. p. 185), is the female of *S. andreniformis*. Laspeyres, in his work on European Sesiidæ, states that he has not seen the female. This sex differs from the male in having three instead of two yellow rings round the abdomen, and in having a black anal tuft with a few yellow hairs on each side instead of the yellow tuft so characteristic of the male. Like the male, the femora are violet black, but the tibial portions of the legs are yellow.

Previous records of *S. allantiformis*:—1. By Mr. Chant, in a wood near Greenhithe, in July, 1829 (Ent. Mag. vol. i. p. 80). 2. By Mr. Harding, also near Greenhithe, in July, 1846 ('Zoologist,' vol. iv. p. 1515). 3. By Rev. A. H. Wratishaw, between Dover and Folkestone, in 1859 (Entom. vol. iv. p. 214). 4. By Rev. A. M. Matthews, near Market Harborough, in 1868 (Newman's 'Moths,' p. 15). 5. By Master Jenney, near Tring, on July 15th, 1876 (Entom. vol. ix. p. 204). 6. By R. C. L. Perkins, at Wootton-under-Edge, in 1886 (Entom. vol. xx. p. 108). 7. Two, by Mr. Davis, at Dover, on July 10th and 14th, 1889 (Entom. vol. xxii. p. 211).—C. W. DALE; Glanvilles Wootton, August 27th, 1902.

PIERIS DAPLIDICE IN SUSSEX.—Mr. A. Wood records in the 'Field' the capture of *P. daplidice* on August 29th, 1902, near the racecourse at Brighton.—F. W. F.

PAPILIO MACHAON IN BERKS.—Mr. A. Wood reports in the 'Field' a specimen of *P. machaon* captured near Wellington College station in July, 1902.—F. W. F.

LYCÆNA ARGOLUS AT ROTHERHITHE.—I captured a male specimen

of *L. argiolus* in this vicarage garden on Aug. 22nd last, as it was flying around some ivy, of which there is a quantity in the garden; one *Pieris napi* and a few *Vanessa urticae* also seen here. There is nothing like a garden nearer here than Southwark Park, which is a good mile away.—H. W. SWEETING; Holy Trinity Vicarage, Rotherhithe, S.E., Oct. 17th, 1902.

DICYCLA OO, &C. IN MIDDLESEX.—On July 27th I took *D. oo* at rest on the trunk of an oak at Palmer's Green. I should like to know if this insect has been taken in Middlesex before. I also took, on Sept. 3rd, *Calymnia diffinis* and *Noctua c-nigrum*, in the same locality, at sugar, and a friend of mine took *Pararge megæra* at Potter's Bar on Sept. 7th.—LAURENCE S. HODSON; 8, The Villas, Palmer's Green, Sept 11th, 1902.

DICYCLA OO IN KENT.—I was very pleased to read of Mr. Browne's capture of this species near Chislehurst, as recorded in the last number (*ante*, p. 267). It occurred very plentifully at Bromley (adjacent to Chislehurst) in 1888, when the late Mr. Collins, of that town, took a great number at sugar, a portion of my own series being some of them; but, strange to say, in spite of much annual sugaring near the "old" ground (now built over), it has never been seen since, to my knowledge, so that Mr. Browne's record proves without a doubt that it still occurs near its old locality.—A. J. LAWRENCE; 76, Samos Road, Anerley, S.E. (late of Ladywell).

DEILEPHILA LIVORNICA IN SOUTH DEVON.—On July 22nd last, just as I was leaving home for Devonshire, I received from Starcross a full-grown Sphingid larva, found by a boy as it was crawling in a lane. At first sight this appeared to me closely to resemble the dark form of *Deilephila galii*. On arriving at my destination I supplied it with *Galium verum* and *G. mollugo*, but it had ceased feeding, and made at once preparation for pupating. It then occurred to me that the time was too early for *D. galii*, and later on, when referring to my books, I found that the description of *D. livornica* tallied with my larva. On Sept. 27th, however, all my existing doubts were dispelled, as on that day a perfect imago of *D. livornica* emerged. During a recent visit to Starcross I ascertained the locality, which is a lane where *G. mollugo* grows in profusion, on which the larva had probably been feeding. I am told that there is no record of this rare moth having been previously found in the larval state in Britain.—J. JÄGER; 65, Saint Quintin's Avenue, North Kensington, Oct. 4th, 1902.

CHEROCAMPA CELERIO IN HAMPSHIRE.—On Sept. 27th I had a living specimen of *C. celerio* brought to me to name, by Miss Stevenson, of Reading (a young collector), who informed me it was sent to her, by post, by some friends who know nothing about entomology, and was taken on Lady Munday's estate, Emsworth, Hants, two days previously.—W. E. BUTLER; Hayling House, Oxford Road, Reading, Oct. 5th, 1902.

LATE EMERGENCE OF CUCULLIA ASTERIS.—This species generally emerges in June, July, and the early part of August, the larvæ in the Essex marshes being found on *Aster tripolium* until quite late in September. This year the imago has continued to emerge during

September, culminating with a very fine perfect specimen bred to-day, September 23rd. This seems to me worthy of record, as the progeny of such late specimens would assuredly perish, as even by the time when the ova hatched the flowers of the sea aster and the alternative food-plant *Solidago virgaurea* would be unobtainable.—(Rev.) GILBERT H. RAYNOR; Hazeleigh Rectory, Maldon, Essex, Sept. 23rd, 1902.

MESOTYPE VIRGATA (LINEOLATA) IN BERKSHIRE.—I am very pleased to add this species to the list of Lepidoptera occurring in the county of Berks. I took one example on August 4th last, on one of the chalk hills near Streatley.—W. E. BUTLER; Hayling House, Reading, Oct. 4th, 1902.

AGROTIS OBELISCA: A CORRECTION.—The species recorded by me as *Agrotis obelisca* (ante, p. 269) has been wrongly determined, and I now find that it is *A. tritici*. I much regret having been led into this error of identification.—G. B. BROWNE.

AGRILUS SINUATUS IN HAMPSHIRE.—During the second week in August this year, I had the fortune to take eleven specimens of *A. sinuatus*. Two were sunning themselves on some sallow leaves, the rest I obtained off one hawthorn bush by beating. This was in Hurst Wood, near Lyndhurst, New Forest. I beat a good many shrubs and trees, but came upon no more of this species. I should like to know upon what the larvæ feed. I and my companion also beat three *Acronycta alni* larvæ in their final skin, and two *Stauropus fagi* in their second skin.—F. N. HITCHCOCK; Ben Omar, South Road, Clapham Park, S.W.

THREE WEEKS IN SOUTH DORSET.—Early in July, Dr. H. M. Stewart and I started off for a holiday in South Dorset, determined to spend a large portion of our time in entomological pursuits. The subjoined list of one hundred and forty-two species of Lepidoptera show that there is a large variety of insects to be met with there, and had the weather been kinder there is no doubt that the list would have been largely augmented.

Of the butterflies, *Hesperia actæon* was exceedingly plentiful in its restricted localities, while *Melanargia galatea* and *Satyrus semele* swarmed on the cliff-sides. *Limenitis sibylla* was seen in sheltered situations near the woods, and *Pieris napi* was coming out in numbers as we left. *Euchelia jacobææ* was very common in the lanes, while the woods gave us plenty of *Lithosia deplana* and *L. lurideola*. Sugaring, sadly interfered with by stormy winds, yielded *Agrotis lunigera*, *Thyatira derasa*, and the commonest insects at it being *Dipterygia scabriuscula*, *Agrotis exclamationis*, and *Xylophasia monoglypha* (polyodon). Fences and trunks produced *Hecatera serena* and *Hadena dentina* in considerable numbers, also *Cucullia umbratica* and numerous Geometrid moths. The heaths swarmed with *Plusia gamma*, while both *Anarta myrtili* and *Heliothis dipsacea* were in some numbers. June would, I believe, be a very good month there in a normal season, and we hope to test it another year.

Rhopalocera:—*Pieris brassicæ*, *P. rapæ*, *P. napi*, *Argynnis euphrosyne*, *A. aglaia*, *A. adippe*, *Vanessa urticæ*, *V. atalanta*, *V. cardui*, *Limenitis sibylla*, *Melanargia galatea*, *Satyrus semele*, *Epinephele ianira*,

E. tithonus, *Canonympha pamphilus*, *Thecla rubi*, *Chrysophanus phlaeas*, *Lycena ægon*, *L. icarus*, *Hesperia actæon*, *H. sylvanus*.

Heterocera :—*Hemaris fuciformis*, *Trochilium crabroniformis*, *Zygæna loniceræ*, *Lithosia deplana*, *L. lurideola*, *Emydia cribrum*, *Euchelia jacobææ*, *Spilosoma lubricipeda*, *Hepialus humuli*, *H. hectus*, *Porthesia similis*, *Malacosoma neustria*, *Odonestis potatoria*, *Thyatira batis*, *T. derasa*, *Acronycta psi*, *A. aceris*, *A. megacephala*, *Leucania conigera*, *L. lithargyria*, *L. comma*, *L. impura*, *L. pallens*, *Xylophasia lithoxylea*, *X. monoglypha*, *X. hepatica*, *Dipterygia scabriuscula*, *Cerigo matura*, *Mamestra sordida*, *M. brassicæ*, *Apamea didyma*, *Miana strigilis*, *M. bicoloria*, *Grammesia trigrammica*, *Caradrina morpheus*, *C. alsines*, *C. taraxaci*, *Rusina tenebrosa*, *Agrotis suffusa*, *A. segetum*, *A. lunigera*, *A. exclamationis*, *A. corticea*, *A. nigricans*, *Noctua triangulum*, *Triphæna ianthina*, *T. fimbria*, *T. comes*, *T. pronuba*, *Orthosia upsilon*, *Hecatera serena*, *Euplexia lucipera*, *Phlogophora meticulosa*, *Aplecta nebulosa*, *Hadena dentina*, *H. trifolii*, *H. oleracea*, *Cucullia umbratica*, *Gonoptera libatrix*, *Habrostola tripartita*, *Plusia gamma*, *Anarta myrtilli*, *Heliothis dipsacea*, *Acontia luctuosa*, *Phytometra viridaria*, *Zanclognatha tarsipennalis*, *Hypena proboscidalis*, *Uropteryx sambucaria*, *Rumia luteolata*, *Metrocampe margaritaria*, *Ellopiæ prosopiaria*, *Pericallia syringaria*, *Amphidasys betularia*, *Boarmia repandata*, *B. gemmaria*, *Tephrosia biundularia*, *Gnophos obscuraria*, *Pseudoterpna pruinata*, *Nemoria viridata*, *Hemithea strigata*, *Acidalia dimidiata*, *A. bisetata*, *A. dilutaria*, *A. virgularia*, *A. marginipunctata*, *A. imitaria*, *A. aversata*, *Cabera pusaria*, *C. exanthemata*, *Macaria liturata*, *Bupalus piniaria*, *Abraxas grossulariata*, *Lomaspilis marginata*, *Larentia viridaria*, *Eupithecia castigata*, *E. subnotata*, *E. minutata*, *E. tenuiata*, *E. pumilata*, *Thera variata*, *T. firmata*, *Hypsipetes sordidata*, *Melanthia bicolorata*, *M. ocellata*, *M. albicillata*, *Melanippe procellata*, *M. unangulata*, *M. rivata*, *M. sociata*, *M. galiata*, *M. fluctuata*, *Anticlea rubidata*, *Camptogramma bilineata*, *Phibalapteryx tersata*, *Cidaria immanata*, *C. dotata*, *C. associata*, *Eubolia limitata*, *E. plumbaria*, *Anaitis plagiata*, *Tanagra atrata*.—E. E. B. PREST; Arva, Dacres Road, Forest Hill, S.E.

LEPIDOPTERA AT THE NEW FOREST IN JUNE.—So much has been said and written of this glorious hunting-ground that I am afraid I can add little that will be of interest. I arrived at Brockenhurst on June 15th, and my first capture was *Hadena genistæ*, at rest on a paling, on my way to our rooms. Needless to say, perfect insects were very backward, and the species that are usually so plentiful in this district at this time of the year were conspicuous by their absence. Larvæ-beating (which I went principally for), on the other hand, was fairly profitable, the following species occurring—mostly from oak—every day during my stay:—*Thecla quercus*, common; *Limenitis sibylla*, larvæ and pupæ fairly plentiful on honeysuckle around tree-trunks; *Nola strigula*, fairly plentiful, very few emerging after successfully pupating; *Liparis auriflua* and *L. monacha*, very common; *Lithosia quadra*, plentiful, but fearful cannibals in confinement; *Malacosoma neustria*, occasionally; *Pericallia syringaria*, a few on honeysuckle; *Himera pennaria*, *Phigalia pilosaria*, and *Amphidasys prodromaria*, all plentiful; *Cleora lichenaria* and *C. glabraria*, occasionally on the lichens, but difficult to find; *Phorodesma bajularia*, very scarce, I only

got two; easily overlooked, owing to its remarkable resemblance to refuse and bits of dead leaves, &c., with which it covers itself; *Cheimatobia brumata*, in swarms, a positive nuisance; several species of the genus *Eupithecia*, difficult to recognize, possibly *E. irriguata* occasionally; *Hybernia defoliaria*, very common, difficult to get into pupæ successfully; *Petasia cassinea*, a few at night on blackthorn, &c.; *Notodonta chaonia*, occasionally, from oak; *Cymatophora flavicornis*, very local—I got seventeen full-fed larvæ from a solitary birch in Stubby Copse on June 20th; *C. ridens*, very few compared with other years; several species of *Taniocampa*, especially *T. miniosa*, rather common; *Anhocelis rufina*, occasionally; *Scopelosoma satellitia*, very common; often found in one's pockets after a day's beating; the same remarks applying to *Cosmia trapezina*; *Agriopsis aprilina*, sometimes at sugar at dusk. *Catacola promissa* and *C. sponsa* were also plentiful, and I successfully reared all those I obtained. I was too late for heather-searching, and missed *Agrotis agathina* and *Noctua neglecta*, although I did obtain one full-fed larva of the former on my return home across the moor on June 19th, but it unfortunately died. Why is this species so difficult to rear? I have tried them now for several years in succession, but without any success. *Genista angelica* produced *Pseudoterpna cytisaria*, which were very plentiful, especially near Jones's Enclosure, Lyndhurst, and at the foot of Hurst Hill, Brockenhurst. What struck me very much on entering the enclosures was the fearfully barren state of the oak. Gazing at the gaunt leafless branches overhead reminded one more of Christmas than of midsummer. Late frosts and countless larvæ had, no doubt, wrought the mischief. It is really a marvel how the latter thrived at all on practically bare branches (which when beaten, strange to say, produced the most larvæ). Probably the lichens are resorted to as a last resource by larvæ. Butterflies were few, only *Argynnis euphrosyne*, *Gonepteryx rhamni*, and *Syrichthus alveolus* appearing in any numbers worth mentioning, with occasionally a stray *Nemeobius lucina* just to relieve the monotony. *Macrothylacia rubi* (males) were occasionally seen, and on June 18th a turf-cutter gave me a very nice female, which he had found on the heather. *Lithosia rubricollis* made up for many disappointments; I was fortunate enough to take forty altogether, mostly found drying their wings on bracken at Aldridge and Hurst Hill. *Macroglossa fuciformis* and *M. bombylifomis* were fairly plentiful on sunny days in the Ornamental Drive, Rhinefields, at rhododendron and azalea bloom. At light, the only visitors that put in an appearance were *Chelonia villica* (very fresh) and a few "daddy long-legs." Lastly, at sugar the following occurred:—First and foremost "ye hornet," and extremely formidable ones too; and then, in their Doubl. List order: *Charocampa elpenor*, several each evening; *Lithosia rubricollis*, one; *Thyatira batis*, common; *Diphthera orion*, three, turning up about 10 p.m.; *Miana strigilis*, two; *Grammesia trilinea*, three, and one var. *bilinea*; *Taniocampa gothica*, one, just out apparently, and two months overdue; *Euplexia lucipara*, one; *Aplecta herbida*, common; and *Erastria fuscula*, common and easily mistaken for *M. strigilis*. Several species of Coleoptera, Diptera, &c., occurred, but, as I do not collect these, I am sorry to say I cannot name them; some were new to me, and most extraordinary. As was the case last

year, sugaring was very bad indeed, the results being extremely poor. *Leucania turca*, which I felt almost certain of getting, was either not out, or extinct, at Hurst Hill. The weather, too, taken on the whole, was shocking—rain almost every day; so, packing up my baggage, I left on Tuesday, June 24th, having only spent ten days in Brockenhurst, where I had intended spending a whole fortnight.—A. J. LAWRENCE; 65, Malyon Road, Ladywell, S.E., Sept. 16th, 1902.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—October 1st, 1902.—The Rev. Canon Fowler, M.A., D.Sc., F.L.S., President, in the chair.—Mr. H. St. J. Donisthorpe exhibited specimens of *Dibolia cynoglossi*, taken by him near Pevensey on the 11th August last. He said that the beetle had not been recorded as British since 1866.—Mr. O. E. Janson exhibited a fine hermaphrodite specimen of *Argynnis paphia*, taken in the New Forest by Mr. Herbert Charles on July 28th, and recorded in the 'Entomologist'; also a melanic specimen of *Papilio demoleus*, from Ceylon, in which all the usual marginal and submarginal yellow markings were absent and the discal markings much obscured; on the under side the yellow markings were entirely wanting.—Mr. C. P. Pickett exhibited a male *Callimorpha dominula* with the hind wings suffused with black, and an extra black spot in the centre, the white spot on the fore wings being absent; and a very large female of the same species, both bred from larvæ found at Walmer at the end of March; and three aberrant specimens of *Triphæna fimbria*, bred from larvæ taken at Wood Street during the same month.—Mr. C. O. Waterhouse exhibited specimens of a wasp (*Zethus chalybeus*) and a neuropteran (*Mantissa semihyalina*), received with a collection of Hymenoptera from Rio Janeiro, suggesting a curious case of mimicry.—Mr. F. B. Jennings exhibited specimens of *Hister merdarius*, from Broxbourne, Herts, part of a large colony of this usually scarce species found with *H. 12-striatus* and other beetles inhabiting a heap of a chemical substance, probably gas-lime, in which also many larvæ, presumably of *H. merdarius*, and burrows, were observed. The soil was warm and moist, and this, and the presence of a quantity of vegetable refuse thrown on the heap, was no doubt the attraction to the Histers to settle there.—Mr. A. J. Chitty exhibited a specimen of *Metoeus paradoxus* with a part of the cells of a nest of *Vespa vulgaris*, in which place the beetle is invariably found. The beetle in the cell tucks in his head, only displaying on the surface the thorax, which is coloured similarly to the face of the wasp. This peculiarity suggests a case of mimicry, and Professor Poulton, F.R.S., said that it fitted in with the case of some other bees and wasps.—Mr. H. Rowland-Brown exhibited, on behalf of Mr. G. F. Leigh, of Durban, a female and male specimen of a rare noctuid, *Musgravia leighi*, Hampson, discovered by him in Natal, and read remarks upon the life-history of the species, communicated by the captor.—Mr. Stanley W. Kemp exhibited two additions to the British list of Coleoptera—*Bembidium argentiolum*, from Lough Neagh, Armagh; and

Læmostenus complanatus, from the neighbourhood of Dublin—taken in June, 1902.—Mr. W. J. Kaye exhibited examples of *Heliconius lindigii*, *H. antiochus*, and *Morpho achilles*, from British Guiana, with notches taken out of the hind wings, presumably by birds; to illustrate that these distasteful or warning-coloured species are subject to attack, this helping to show that experimental tasting, as propounded by the Müllerian theory of mimicry, does exist and go on.—Professor L. C. Miall, F.R.S., communicated a paper by Mr. T. H. Taylor, M.A., entitled "The Tracheal System of *Simulium*."—Professor Auguste Forel, M.D., communicated a paper entitled "Descriptions of some Ants from the Rocky Mountains of Canada (Alberta and British Columbia) collected by Edward Whympers."—Dr. T. A. Chapman read a paper entitled "On *Heterogynis paradoxa*."—H. Goss and H. ROWLAND-BROWN, *Hon. Secretaries*.

October 15th.—Professor Edward B. Poulton, M.A., D.Sc., F.R.S., Vice-President, in the chair.—Mr. A. J. Chitty showed an entirely black specimen of *Metoeus paradoxus*, as tending to disprove the mimicry suggested by him at the meeting on Oct. 1st. Dr. Chapman said that in his experience one out of every six specimens of this species was black. Mr. Donisthorpe stated that out of about one hundred specimens he had never caught or bred a black *Metoeus*.—Mr. E. P. Pickett exhibited a variety of the female of *Argynnis aglaia*, varieties of *Satyrus ianira*, and a long series of *Lycæna corydon*, taken near Folkestone and Dover in August last, including four males of the last-named species, with the black band on the edge of the fore wings much deeper than usual; also twelve dwarf male specimens of this species, four dwarf females, and many other aberrant forms. Mr. Goss said this dwarf form of *L. corydon* occurred constantly, according to Mr. Sydney Webb, in one valley about two miles east of Dover, but he was unaware of its regular occurrence elsewhere in this country. He remarked that a dwarf form of *L. arion* occurred wherever the type was found, both in Gloucestershire and Cornwall. Professor Poulton, Dr. Chapman, and Mr. Sloper also remarked on the dwarf forms of *L. corydon*.—Dr. Chapman exhibited specimens of *Notodonta (Hybocampa) dryinopa* from Queensland. It was remarkably similar in appearance, structure, and habits to *Hybocampa milhauseri* (see 'Entomologist,' 1889, and p. 43 of 1902). He stated that the pupa with a similar spine to that of *H. milhauseri* does not cut out a regular oval lid from the cocoon like that species, but by a stabbing process pierces it with a number of holes, so that a piece is more easily pushed off. The cocoon being covered with bits of bark, stone, &c., a cutting process would be impossible, whereas the cocoon of *H. milhauseri* was of pure gum-like silk. He pointed out that the larva much resembled that of *H. milhauseri*, but the hinder segments were more like those of *Stauropus fagi*. He also exhibited living eggs, larvæ, and imagines of *Orina tristis* var. *smaragdina*, from Pino, Lago Maggiore. The beetles, since they were taken on May 30th, had laid many eggs. Dr. Chapman said that the embryo, ready to hatch, might be seen within some of the eggs, and its hatching spines observed. Mr. Sloper exhibited a specimen of *Lycæna hylas*, said to have been caught at Dover on the 7th September last.—Mr. Martin Jacoby communicated a paper entitled "A further Contribution to our Knowledge

of African Phytophagous Coleoptera.”—Mr. Malcolm Burr read a communication from Hofrath Dr. Carl Brunner von Wattenwyl, entitled “Observations sur le nom générique *Acrida*.”—H. Goss, *Hon. Secretary*.

SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—

September 11th.—The President in the chair.—Mr. South exhibited a series of *Pygæra curtula*, bred from ova laid by a large silver-grey female taken at Batchworth. The larvæ were fed on poplar, and the imagines were all small and dark in colour.—Mr. Turner, two Longicorn Coleoptera taken by Mr. Tutt at Torre Pellice—viz. *Cerambyx heros* (*cerdo*) and *Purpuricenüs koehleri*.—Mr. Kemp, numerous species of Coleoptera taken in the New Forest in August, including *Prionus coriarius*, *Halyzia 16-guttata*, *Abdera bifasciata*, *Bembidium decorum*, *Tomoxia biguttata*, and *Deronectes latus*.—Dr. Chapman, examples of the Hesperid *Heteropterus morpheus*, from St. Jean de Luz, and cases and imagines of the Psychid *Oreopsyche leschenaulti* from San Sabastian.

September 25th.—The President in the chair.—Dr. Chapman exhibited typical examples of *Euchelia jacobææ*, bred from larvæ found at Bejar, and stated that the black bands or rings of the larvæ were broken into four black marks.—Mr. Kaye, a short series of *Leucania albipuncta*, from the Isle of Wight, taken this year. Mr. Kirkaldy, a remarkable case of insect mimicry in a number of Brazilian Rhynchota. *Mabelia pulcherrima*, a new species of Miridæ, was shown with the Pyrrhocorine *Theraneis oleosus*, from Costa Rica, and *T. luridus*, from Brazil.—Mr. Kemp, species taken by him at various field-meetings of the Society:—Wisley, July 5th, Coleoptera: *Donacia thalassina*, *Pæderus riparius*, *Agrilus angustatus*, *Xyloborus dryophagus*, and *Antherophagus nigricornis*. Odonata: *Orthetrum cærulescens*. Epping Forest, Sept. 20th, Coleoptera: *Zeugophora flavicollis* and *Ilybius fenestratus* Oxshott, Sept. 6th, Coleoptera: *Hydaticus seminiger*, *Pelobius tardus*, *Ilybius ater*, *Rhantus bistratus*, *Bidessus geminus*, *Hydroporus tristis*, *H. umbrosus*, and *Cælambus impresso-punctatus*.—Mr. Lucas, a coloured sketch of a var. of *Asphalia ridens*, bred from the New Forest. The contrast of light and dark markings was unusually strong. He also showed a specimen of a very rare Dipteron, *Physocephala nigra*, and a female of *Ectobia lapponica*, with its egg-capsule, which it had carried protruding for five days before dropping it. Mr. Colthrup, *Lasiocampa quercus* vars. (1), with splashes of yellow at base of fore wings; (2), male with male antennæ and wings, but body showing ova through abdomen; (3), with yellow band on hind wing extending to fringes; also *Agrotis corticea*, with a white submarginal band on the fore wings.—Mr. Lucas read the report of the field-meeting held at Wisley on July 5th, and exhibited lantern slides to illustrate his remarks.

October 9th.—The President in the chair.—Mr. Jennings, four rare species of Coleoptera:—*Cathormiocerus socius*, from Sandown, Isle of Wight; *Gymnetron liniariae*, from Southport; *Baris lapidii*, from Edmonton Marsh; and *Hister merdarius*, from Broxbourne.—Mr. Kemp, examples of *Carabus violaceus* var. *exasperatus*, from North Cornwall and the New Forest.—Mr. R. Adkin, a *Cossus ligniperda* from the same fence referred to in the ‘Proceedings’ for 1889 and 1900, and read notes.—Dr. Chapman, imagines, pupæ, and cocoons of *Hybocampa* (*Notodonta*) *dryinopa*, from Queensland.—Mr. South, four aberrations of

the female of *Lycæna corydon*, including two fine examples of var. *syngrapha*; all were taken by the Rev. C. A. Sladen, in Wiltshire. He also exhibited, on behalf of Mr. Robinson, of Bosecombe, Hants, *L. minima*, almost devoid of markings on the under surface, from Swanage, and *Ematurga atomaria*, a melanic male from Bournemouth. *Zonosoma pendularia*, four specimens from Market Drayton, of a dark gray form, said by Mr. Woodforde to be typical of the district; also a specimen of the rare *Pyrallis lienigialis* taken near Oxford, Aug. 22nd, 1902, and sent to Mr. South for identification, by Mr. Robinson.—Mr. Clark, a large number of slides illustrative of his paper entitled "Contributions to the life-history of *Argulus foliaceus*, the parasite of the stickleback."—HY. J. TURNER (*Hon. Rep. Secretary*).

RECENT LITERATURE.

Catalogue of the described Orthoptera of the United States and Canada.

By S. H. SCUDDER. (Proc. of the Davenport Acad. of Nat. Sciences, vol. viii.) Oct. 1899.

Though somewhat late in reaching us, this useful pamphlet is not less welcome. We find that the total number of species at present known for the United States and Canada is about eight hundred and fifty-six, nearly double that given in Brunner's 'Prodromus' for Europe, while of course there is more scope for additions there than in Europe. Four of the earwigs, five cockroaches, and the house cricket are either British insects, or have at least been taken here. What appears to be a useful synonymy accompanies each species, and there is an appendix giving descriptions of eleven new species, and illustrated by three good plates.

W. J. L.

The Tettigidae of North America. By JOSEPH LANE HANCOCK.
Chicago. 1902.

Preceded by an excellent and lengthy introduction treating of the habits, anatomy, &c., of a family of rather curious grasshoppers, and followed by many notes on vivarium experiments, this splendidly got up monograph of one hundred and ninety pages will be read with interest by all students of the Orthoptera who are able to procure it. Each species, some eighty-seven in all, is fully treated, and the work is enriched by a number of illustrations in the text, and eleven plates, several being very beautifully executed photogravures. Periodically revisions and monographs of parts of the American Orthoptera appear. In the pages of the 'Entomologist,' Scudder's 'Revision of the Melanopli' has already been noticed, while we have before us an excellent illustrated 'Revision of the Truxalinae of North America,' by Mr. Jerome McNeill (Nov. 1895), which has not previously been noticed in these pages. The treatment of the latest group to be looked after—the Tettigidae—shows up well in company with the rest.

W. J. L.

Faune Analytique illustrée des Orthoptères de France. By C. HOULBERT.
Paris. 1900.

The present is a suitable opportunity for calling attention to a cheap publication extracted from the 'Feuille des Jeunes Naturalistes,' année 1900. It consists of short descriptions of the French Orthoptera, and a very large number of sufficiently well-drawn figures. As the French Orthoptera contains practically the whole of the British, this treatise should be of considerable use to British orthopterists as well as to their French brethren.

W. J. L.

Aquatic Insects in the Adirondacks. (Bulletin No. 47, New York State Museum.) By J. G. NEEDHAM. Albany, U.S.A. Sept. 1901.

In this bulky and extremely interesting bulletin we have the result of ten weeks spent by Dr. Needham and his assistant, Mr. C. Betten, in examining the aquatic insect fauna of this district in the north-east of the State of New York. Dr. Needham's work, especially in connection with the Neuroptera, is getting well known amongst English entomologists, and by them this report will be read with interest. The entomological field-station in the Adirondacks was taken up "to collect and study the habits of aquatic insects, paying special attention to the conditions necessary for the existence of the various species, their relative value as food for fishes, the relations of the forms to each other, and their life-histories." Accordingly, "the routine work of the station consisted in collecting and studying aquatic insects in all their stages of development, in conducting feeding experiments, in making quantitative studies of the life of certain situations, in gathering the materials for the study of the natural and habitual food of trout, bullfrogs, and some of the larger species of dragon-flies, in running trap-lanterns, and sending their nightly catch to the State museum, &c." As a result, about one hundred life-histories were worked out in more or less detail, material additions were made to the list of insects occurring in the State, while ten new species and two new genera were discovered. In the 213 pages of text there are forty-two illustrations, while there are in addition no less than thirty-five plates, several of being them coloured. Would not many of the remote and less-known British and Irish lakes repay similar close attention?

W. J. LUCAS.

Genera Insectorum. (Published by P. Wytsman, Brussels.) Fasc. 3: Coleoptera Clavicornia, Fam. Lathridiidae, by R. P. BELON. Pp. 1-40; 1 Plate.—Fasc. 6: Lepidoptera-Rhopalocera, Fam. Papiilionidae, sect. Troides, by R. H. F. RIPPON. Pp. 1-15; 2 Coloured Plates. (1902.)

The plan of this work is to provide a systematic account of all the genera of the Insecta, including a list of Species. Having regard to our fragmentary knowledge of certain families, considerable time must necessarily elapse before the completion, but if all the groups are treated in the same manner as those before us, the work will retain a

very high position in entomological literature. The paper is substantial and the printing clear, while the size is convenient. We have only two parts for review, but apparently each part is paged separately and complete in itself. After a general survey of classification, a key to the genera is given, followed by a description of each genus, a list of their several species (with synonymy), accompanied by their geographical distribution. The third fascicule summarizes the Lathridiidae, a family of tiny clavicorn beetles, of which 5 tribes are accepted, containing 22 genera and 435 species; these are elucidated by a plate containing 28 species. The sixth fascicule is treated in a more sumptuous fashion, being adorned with two plates, embracing some fourteen coloured figures and eight details of venation. Six genera of "Troides" (Ornithoptera, &c.) are upheld, and 46 species are enumerated, of which, however, little more than thirty are considered by Rippon to be good species.

G. W. K.

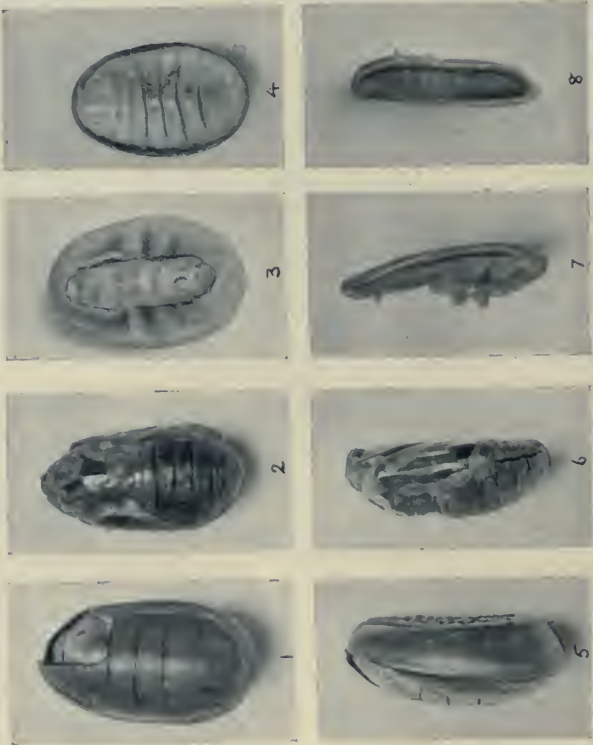
E. P. FELT. (a) "Elm Leaf Beetle in New York State," Ed. 2 57th Bull. New York State Mus., pp. 1-43; 8 Plates (1 coloured) and 2 text figures. Aug., 1902.—(β) "17th Rep. of the State Entomologist for 1901;" 53rd Bull. New York State Mus., pp. 699-925; 6 Plates and 29 text figures. Aug., 1902.

These two recent bulletins maintain the high repute of the publications of the New York State Entomologist. The 57th (No. 262 of the State University) being a revision of the 20th (June, 1898).

Although comparatively easy to control, the elm-leaf beetle (*Galerucella luteola*) is still the cause of extensive injuries to elms in cities and villages along the Hudson, and is regarded by Dr. Felt as the most important natural enemy of shade-trees in New York State. The causes for this condition of affairs are not hard to find, as the majority, if they notice the work of this pest at all, are inclined to trust in Providence and hope that its ravages will not be as severe the next season." The beetle is widely distributed over Europe, and is abundant and destructive in parts of Germany, France, Italy, and Austria. It is supposed to have been introduced into America about 1834, and its extension there now is from north of Massachusetts to North Carolina. It was noted in Albany about 1892, in 1897 most of the European elms in the streets were completely defoliated, and it is computed that fully 1000 elms were destroyed within the city limits in 1898. Dr. Felt cites cases even more lamentable in other towns. A coloured plate shows the metamorphoses, the other illustrations consisting of photographs of damage, spraying operations, and so forth. This bulletin should be as necessary to the restricted European worker as to the American.

The chief pest noticed in the 53rd Bulletin (No. 263 of the State University) is the Hessian Fly (*Cecidomyia destructor*), the rest of the report being taken up chiefly with a description of the Entomologic Exhibit, which must have been of exceptional interest, at the Pan-American Exhibition in 1901.

G. W. K.



W. J. Lucas } photo ad nat.
R. H. Carter }

LIPHYRA BRASSOLIS, Westw.

West, Newman proc.

Entom. xxxv. p. 153 & p. 225.)

1. Larval shell showing pupa inside ; 2. Pupa extracted from larval shell ; 3. side view. 3. Larva, ventral surface ; 7, side view. 4. Larva, dorsal surface ; 8, side view, slightly oblique.

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LIFE-HISTORY OF *VANESSA ANTIOPA*.

By F. W. FROHAWK, M.B.O.U., F.E.S.

I AM deeply indebted to Mr. Frederic Raine for his kindness in procuring for me living examples of *V. antiopa*, which has enabled me to work out the life-history of this interesting species. On the 7th of April last I received from this gentleman eight females and three males, alive, which he captured at Hyères on the 5th; again, on the 7th, he caught two males and one female, and these he also sent me, arriving on the 9th. Five females of the first consignment I placed on two growing plants of willow, the same morning they reached me, but owing to the continuance of cold dull weather they remained quiet until the 13th, and on the 14th, with bright sunshine at midday, I had the pleasure of watching one of the females deposit a number of eggs, and made a sketch of her in the act. She clung to a small stem, and deposited 192 eggs in one batch, which encircled the stem; while depositing the end of the abdomen curves from side to side of the branch; the ovipositor, feeling for the last egg laid, carefully places another beside it, in circles round the stem, working upwards, until the batch is completed. On this day another batch was deposited by another female, and others on the following days; so that by the 25th eight batches were laid. These five females continued depositing at intervals for several weeks, and the last eggs were laid in small batches on June 27th.

On May 21st four batches were laid, consisting of about 450 eggs, the smallest batch containing 53, and the largest about 160. On May 27th another lot of eggs deposited in four batches, the smallest batch of 3 doz. and the largest 170—in all 336. All five females still alive on May 25th. The first one died on the 26th; the other four were quite lively, and had a big drink each after

depositing the 336 eggs. Another female died on June 4th ; the third one died on June 22nd. On June 27th 100 more eggs were deposited in batches ; these were the last eggs laid. The following day another female died, and on June 30th the last one succumbed, having lived in my possession exactly three months (eighty-four days).

From the above it will be seen that this species deposits its eggs in two or three or even more batches, averaging from about 150 to 250 eggs in a batch. When a stout stem is selected for the eggs, the batch does not encircle it, but only covers that portion (generally about half the circumference, and always on the under side) which the abdomen can cover with the ovipositor. These five females laid over 2000 eggs—as well as I could count them, I found there were about 2200 ; therefore the complement of eggs laid by *antiopa* numbers between 400 and 500. When resting these butterflies usually clustered together at the top of the gauze covering the plant.

The egg measures $\frac{1}{8}$ in. high, of an oblong form, and having, as a rule, eight, but occasionally nine, longitudinal keels, commencing below the summit, and rising prominently ; they then gradually decrease in height, and disappear before reaching the base ; they are fluted, and resemble white frosted glass ; the spaces between the keels are slightly concaved, and very finely fluted transversely, the ridges being extremely fine. The micropyle is slightly raised in the centre, and is finely granulated ; near the base the surface is faintly ridged longitudinally ; the base is firmly embedded in glutinous substance. The colour when first laid is a rather deep ochreous yellow, inclining to olive-yellow, which very gradually deepens to an olive-brown to the naked eye ; but when viewed under the microscope the whole surface presents a finely mottled appearance, resembling in pattern crocodile-skin, the ground colour being amber-brown, with light amber-yellow reticulations ; this pattern is under the shell. When about fourteen days old one batch of eggs had changed to a deep lilac-red, approaching indian-red, and on the eighteenth day had assumed a deep leaden grey, and hatched on the 21st. Other batches did not attain such a deep red colour, the normal change of colouring being from a deep ochreous-yellow and olive-brown to a deep red-brown ; then the larva begins to show under the shell, exhibiting a pale ochreous body and dark brown head, which gradually turns to black ; the shell is then of a glistening pearl-grey. To the naked eye the entire batch appears of a beautiful silver-grey-blue just before hatching. The larva begins making its exit by nibbling tiny holes in a circle round the crown of the egg ; this continues until it is completely cut round ; then it pushes off the cap and emerges. It immediately starts spinning a carpet of silk as it crawls away, spinning as it goes, crawling to the extremity of the branch.

They all do precisely the same, and at once form a colony on the last cluster of leaves, covering the bases with web, on which they live and feed in company.

The first batch hatched on May 3rd, remaining in the egg state nineteen days; this batch contained 192 eggs, all of which hatched, excepting one. On May 5th another batch hatched, and all did the same as the first lot; and on the 16th a very large batch hatched, the eggs being on the same branch as those which hatched on the 5th; and directly the larvæ emerged they all started spinning and crawling up the branch till they arrived at the part already covered with web by the previous brood, and, following the web-covered branches, every individual of the large batch ascended and joined the elder company, which were eleven days old; the two families then formed one big community, the ones just hatched nestling among their larger companions. On the 17th of May another big batch emerged, which divided into two companies.

The larva, directly after emergence, measures $\frac{1}{6}$ in. long; the head is large and shining black, and a few fine black bristles are scattered over the surface; the segmental divisions are clearly defined, each segment having about four transverse wrinkles and ten black hairs (five on each side); those on the dorsal surface are very long, slightly curved, and three in number above the spiracle; immediately behind the spiracle is another, which projects laterally; and slightly in front and below the spiracle is the fifth, which curves downwards; all these are black, with shining black bulbous bases; the surrounding skin is bare of the minute black granulations which cover the whole of the surface of the body; these bare places form a pale circular disk round each hair, and also the spiracles, which are black; the claspers are granulated with black at the base, and have two whitish spines directed downwards; the foot is large, and furnished with very ample claws. The entire colouring of the body is pale olive-yellow, inclining to citron.

The larvæ always rest in a dense mass, all crowded together, some on top of the others; they cover the leaves with web. As soon as the leaves are stripped of the cuticle the entire company move to a fresh supply. If disturbed they curve upward the anterior portion of the body, and remain in that attitude for a short time. When the whole company are slightly on the move in the sun, they form a curious sparkling mass, due to the immense number of glistening black heads.

Shortly before the first moult the larva measures $\frac{3}{14}$ in. long; it is uniformly cylindrical, the segments deeply incised and very glossy. The ground colour is amber-brown, with a medio-dorsal series of longitudinal dark brown marks, and mottlings of the same colour form a dark spiracular band; the spiracles are also amber-brown; the sub-dorsal surface is freckled with brown.

When undergoing the change for moulting they occasionally move about on the web-covered leaves, a habit unusual among other species of butterflies.

The first moult occurred on May 20th. Directly after moulting the head is ochreous, but in a very short time turns jet-black and shining; also there are ochreous dorsal markings, which soon change to dull brown.

Before the second moult, when twenty-three days old, it measures $\frac{2}{5}$ in. long; the body is covered with minute black points, being so small that they give the glossy surface a granular appearance; besides these, tiny black warts are sprinkled over the whole surface; these vary in size, and each emits a tiny black hair; there are also longitudinal rows of small black tubercles; the first is medio-dorsal, the second sub-dorsal, the third super-spiracular, and the fourth sub-spiracular; these all terminate in a rather long, slender, curving, black bristle, and several shorter ones spring from the sides of each tubercle; the spiracles are black; the ground colour is brown freckled with ochreous, and a broad band of the latter colour extends dorsally, which is broken up by a medio-dorsal series of dark markings as in the previous stage; the head is shining black and beset with hairs; legs shining black; the claspers are clear ochre-yellow, the same colour as the dorsal band. The larvæ feed upon the topmost leaves, at first eating the basal portion of them, which hang down by the weight of the larvæ, the ends resting on the next lot of leaves, and feeding on these in turn, and so on, working their way downwards, feeding as they go, eating all the leaves, and covering everything with web.

Second moult on May 27th. Before the third moult—twenty-nine days old—it measures $\frac{7}{10}$ in. long. The ground colour is a deep ashy or purplish black; the dorsal band orange, broken up with black markings as in former stage; immediately below the spiracles are very faint crescentic markings, almost invisible; the tubercles of the previous stage are now developed into moderately long black spine-like tubercles, each terminating in a longish curved white bristle, and numerous much smaller lateral hairs, and all the minute body-warts bear white hairs instead of black as in the last skin; the head and legs are shining black, with fine white hairs; the claspers are amber colour. The medio-dorsal series of spines are very short, and commence on the sixth segment and end on the eleventh, one on each of these six segments. They still remain gregarious. When one branch is denuded of leaves, they all descend until reaching another branch, which they ascend to the end, and, again clustering together in a mass, feed downwards as before; when moving they are extremely active, and feed rapidly. Warm weather greatly influences the rapidity of their growth, cold retarding them considerably.

Third moult on June 2nd. Before the fourth moult—thirty-four days old—it measures $1\frac{1}{4}$ in. long; the ground colour is velvety black, otherwise very similar to previous stage, but the dorsal orange band is richer and deeper in colour, and there are numerous very small pearly-white warts sprinkled over the body (mostly forming circles round each segment on the two posterior wrinkles); these, as well as the minute black warts, emit fine curved white hairs; the black spines also bear fine white hairs; the dorsal spines terminate with black spine-like bristles; the super- and sub-spiracular spines end with longish curved white hairs with black tips; the black head is bilobed and cleft on the crown, and covered with white hairs; legs shining black; claspers bright tawny, excepting the anal pair, which are black; on the eleventh segment is a small medio-dorsal shining black disk, and on the twelfth segment is a much larger one, which closely resembles the head. They still live in close company.

(To be continued.)

GONEPTERYX RHAMNI AND CLEOPATRA IN IRELAND.

By E. BAGWELL-PUREFOY.

IN the December number of the 'Entomologist' for the year 1896 (xxix. 363), I reported the successful introduction of *Gonepteryx rhamni* into the County Tipperary. A few further notes on the subject may possibly prove of interest. To recapitulate as briefly as possible:—In 1890, and again in 1894, a number of plants of *Rhamnus frangula*, and a few of *R. catharticus* were planted about over grounds which may be roughly estimated at five hundred acres. In the autumn of the latter year, between two and three hundred imagines of *G. rhamni* were turned out in the most suitable spots of the same grounds. The result, as observed in 1896, was of a most gratifying nature; the butterflies had "caught on," and had enormously increased in numbers.

During the five succeeding years I was continuously abroad, and plants and insects alike were left strictly to take care of themselves. Returning home once more in the autumn of 1901, I visited the South of Ireland about the middle of September, and found that the plants, on the whole, had done well, many of the *R. frangula* having grown into fine big trees; some of the *R. catharticus*, too, had not only survived, but had developed into strong plants. The first bit of sunshine revealed the fact that *G. rhamni*, also, was still flourishing, and, during a fortnight of fair weather, I counted a goodly number on the wing.

Early in November I planted out one hundred small trees of *R. frangula* around the borders of the place, and, at the same

time, I placed about in the shrubberies a few each of some eight different foreign species of *Rhamnus*. The unfavourable spring of this year kept me from paying the district a visit before June 24th, and this date proved quite early enough. The number of ova and small larvæ which I observed was quite astonishing. From off the newly planted *R. frangula* I took over three hundred and fifty larvæ; half of these I placed on older trees better able to support them, and the other half I brought in to rear myself, but of these more anon. I may mention here that it is not the healthiest trees with abundance of foliage that receive the best patronage, but rather the weaklings—sometimes, indeed, those that are just dying off—and many larvæ must perish every year through this peculiar *penchant* of their mothers.

The “foreigners” had all been planted in pet, sunny spots, and were growing well. Five out of the eight species received attention from *G. rhamni*, and four out of the five produced fine-sized larvæ in due course. The following are the plants in question:—*R. latifolius*, *R. tinctorius*, *R. purshianus*, *R. imeritinus*, and *R. alpinus*. A considerable number of eggs were laid on the last-named plant, but the little larvæ did very badly on it. Of six that I brought in, I only succeeded in obtaining one pupa. This pupa was considerably less than half the normal size, and failed to produce an imago. *Latifolius* was the only evergreen species which was noticed, and it produced the largest larvæ I have seen.

On June 16th I received twelve dozen pupæ of *Gonepteryx cleopatra*, which Mr. H. W. Head, of Scarborough, had procured for me from South Austria. Some of the insects began to emerge before I was able to get over to Ireland on the 24th, but these were kept snug in a big tin box with wet grass, and in no way suffered. The last imago appeared on July 1st, and, all told, I had been able to liberate about one hundred healthy insects. The place is peculiarly suited to an experiment of this kind, the young plantations being intersected by broad rides, sheltered from the wind and open to the sun, with an abundance of wild flowers, and, lastly, a total absence for miles around of the man with the net and collecting box. *Cleopatra* quickly settled down to her changed surroundings, and very comely she looked floating about in the sun—a sun which failed not during the first few days of her liberation. Bramble blossoms proved the chief attraction at first, and later on thistle-heads, scabious, knapweed, and other composites.

I had found it very hard to obtain any information about this insect, and was working under the impression that it was single-brooded, after the manner of our native *G. rhamni*. I was, however, quickly undeceived. Pairing commenced at once, and on July 13th I observed a female depositing ova on a big

tree of *R. frangula*. The male insects are the most ardent suitors imaginable, and I have many times watched one for over half an hour persisting in a courtship which was evidently not welcome. In this particular case the female had laid several eggs on the tree, and was proceeding down the ride to another bush, when she was seized upon by a male, and the usual struggle for supremacy began. I watched them for many minutes, till they finally disappeared over the tops of the larch trees. (I have since had access to certain German works on European butterflies at the Natural History Museum, South Kensington, and find that the fact that this variety is double-brooded is well known.) From the middle of July onwards the work of ovipositing was busily proceeded with, *R. frangula* receiving nearly all the attention, *R. catharticus*, however, being noticed occasionally.

Up to this point all had gone smoothly, but, alas! this was not to continue: the little larvæ, on emerging from their eggs, did not look upon *R. frangula* as food fit to be eaten. Some, indeed, nibbled a little, and kept themselves alive for three or four days, and then disappeared, but the large majority passed away at once, and were no more seen. Better luck, however, attended those few which found themselves born into the world on *R. catharticus*. Provided they had been laid on, or had access to, the tender, only half-unfolded leaves of a young shoot, their fate was never in doubt. They crawled into one of these half-closed leaves and remained there until after the first moult, or perhaps longer. For the first half of their larval career they ate nothing but the very youngest leaves, and even when nearly full-grown would refuse foliage which was in the least degree old or tough. Thus I was confronted by the annoying spectacle of the mother butterfly almost invariably choosing the useless food-plant whereon to place her eggs, and passing by the one really suitable for her purpose. On several occasions I have seen a female, after hovering all round a bush of *catharticus*, refuse it, and proceed at once to a neighbouring *frangula* and lay on it. The full-grown larva of *cleopatra* is generally slightly superior in size to that of *rharni*, and exhibits a bluish hue over the dorsal surface, the white lateral lines being remarkably clear. The pupal stage, I found, lasted twenty-five days, sometimes a little longer, and for eight to ten days previous to emergence the orange colour on the fore wings of the males showed through the wing-cases as a broad patch of colour. The previous autumn I had planted out three or four small plants of *R. alaternus* var. *angustifolius*, and I placed several newly-hatched larvæ on sprigs of this plant, but they would not touch it. This I am quite unable to explain, *alaternus* being the natural food-plant of *cleopatra* in Southern Europe.

As soon as I had quite convinced myself that *R. frangula*

could not rear them, I proceeded to collect all the eggs I could find on that plant, and transfer them to *R. catharticus*, by the simple expedient of pinning the portion of leaf wheron they had been deposited to the most suitable situation on the new shrub. In this manner I procured a large number of larvæ, the food-plant evidently suiting them admirably, as comparatively few failed to grow and wax strong.

On August 4th, a bright, sunny day after several dull ones, I placed a box containing a number of my home-reared *G. rhamni* beneath a clump of brambles and left it open, so that the insects could fly as soon as they felt inclined to. Returning to the spot a couple of hours later, I was surprised to see no less than four males of *cleopatra* hovering over the brambles, but on drawing quietly near their presence was soon explained to me. Beneath each *cleopatra* was the quivering form of a female *rhamni*, with abdomen pointing upwards and wings half open and flattened out in a most unnatural position. The unexpected and unwelcome suitors were most persistent in their court, and by sheer rough treatment one after the other succeeded in forcing the object of its attentions to take to wing, when the pair would soar high in the air and then return low down among the herbage, the female doing her utmost to escape. Later on in the month the wild chase of *rhamni* by *cleopatra* was a matter of common occurrence, though whether any results were obtained is more than doubtful.

At the end of August I had to return to England, and it was necessary to abandon my caterpillars to their own devices. I, however, took with me half a dozen pupæ* (just turned), and about fifty larvæ of *cleopatra*, which were all doing well. On the *R. catharticus* of the hedgerows of Bucks I found no succulent young leaves to offer them, and the want of these made itself apparent at once. Many turned prematurely, and many died. How those that I left behind have fared I know not, but their parents were still on the wing, healthy and strong, up to the end of August, and I am of opinion that they will so have continued through September.

NEW SPECIES OF INDIAN CHRYSIDIDÆ.

By MAJOR C. G. NURSE, Indian Staff Corps.

THE species described in the following paper form part of a collection of Hymenoptera made by me during the past two years at Deesa in Northern Gujarat, Quetta in Baluchistan, and during a two months' trip to Kashmir in 1901.

* Two of these pupæ kindly sent to me by Mr. Purefoy produced fine specimens of *cleopatra* in September last.—R. S.

NOTOZUS KASHMIRENSIS, n. sp.

♀ ♂. Front from above base of antennæ to about half-way to vertex concave and finely striate, the striæ running in a circular direction, with the base of antennæ as centre; remainder of head and thorax somewhat coarsely punctured, except the extreme base of mesonotum, which is finely punctured; abdomen very finely and minutely punctured; inner orbits parallel; mucro conspicuous and very coarsely punctured, rounded at apex; abdomen about the length of the head and thorax united, very convex above, gradually rounded towards the extreme apex, which is transverse or slightly emarginate. Deep metallic blue or blue-green, the antennæ and tarsi rufo-testaceous; wings hyaline at base, the outer half infuscated, tegulæ shining bronzy brown; abdomen and legs covered with a very sparse and short greyish pubescence, only perceptible with a strong lens; the antennæ, when examined under a microscope, are closely punctured and densely hairy. Long. 4-5 mm.

Hab. Kashmir, 5000 ft., on the banks of the Jhelum; several specimens.

This genus has not been previously recorded from India.

ELLAMPUS TIMIDUS, n. sp.

♀. Head, pronotum, and mesonotum shallowly and somewhat irregularly, scutellum, postscutellum, and median segment more coarsely and closely punctured, abdomen impunctate; the incision at the apex of abdomen, characteristic of the genus, small and inconspicuous. Deep metallic blue; antennæ piceous, microscopically hairy; tarsi testaceous; clypeus with a few long hairs, legs with greyish pubescence, head, thorax, and abdomen almost entirely smooth; wings hyaline, nervures testaceous, tegulæ brownish testaceous.

♂. Similar; more conspicuously shining; vertex of head, pronotum, and mesonotum above almost, if not quite, impunctate. Long. 2.5-3 mm.

Hab. Quetta; Peshin; five specimens.

This species has not previously been recorded from India.

HOLOPYGA CUPREATA, n. sp.

♂. Front from below vertex to base of antennæ very concave, and finely transversely striate, head behind ocelli somewhat finely punctured; remainder of head, thorax, and median segment coarsely, abdomen closely and finely punctured; head slightly wider than pronotum, abdomen slightly longer and broader than thorax; a little short, sparse pubescence, visible only with a lens, on the head, legs, and abdomen; a trace of a median longitudinal carina on 2nd abdominal segment. Head and thorax dark blue, the vertex, pronotum, and mesonotum with a greenish tinge; abdomen brilliant coppery golden, scape of antennæ dark blue, flagellum and tarsi very dark testaceous, almost black; wings hyaline, at base, the outer half tinged with fuscous, tegulæ black. Long. 5-6 mm.

Hab. Kashmir, 5000-6000 ft.; two specimens.

HEDYCHRIDIMUM PERVERSUM, n. sp.

♀ ♂. Vertex of head, and thorax, closely, but not very finely, abdomen minutely and regularly punctured—all the punctures somewhat shallow; front concave, with stiff, white pubescence, which hides the sculpturing; pronotum smaller than the head, its sides almost parallel; posterior angles of median segment acute and conspicuous; abdomen wider than head and thorax. Metallic green, with some bluish reflections, especially about the joints of the segments and near the tegulæ; abdomen with a slight coppery effulgence; flagellum of antennæ dark rufous; the whole of the head, thorax, abdomen, and legs covered with very short greyish pubescence; wings hyaline and iridescent, nervures testaceous, tegulæ metallic blue or blue-green. Long. 2.5–3 mm.

Hab. Peshin; Quetta; five specimens.

The smallest species hitherto described from India.

HEDYCHRIDIMUM SELECTUM, n. sp.

♂. Head and thorax closely and finely, postscutellum more coarsely, abdomen minutely and closely punctured; pronotum and head subequal, the former with its sides almost parallel; abdomen wider than thorax, very convex, 3rd segment almost vertical. Dark blue; 2nd abdominal segment with purple reflections; antennæ dark rufous, tarsi testaceous; wings hyaline, their apical margins very slightly darker, nervures and tegulæ testaceous; a little sparse, short, greyish pubescence on head, thorax, abdomen, and legs. Long. 3.5 mm.

Hab. Quetta; a single specimen.

This species is easily distinguished from *H. perversum* above by its being dark blue, and not light green, and by its longer pronotum. The basal nervure is also more sharply curved in the present species than in *H. perversum*.

CHRYISIS JALALA, n. sp.

♀. Slenderly built; head, except front, thorax, and abdomen, closely but not very finely punctured, and very sparsely covered with short greyish pubescence; clypeus emarginate anteriorly, front concave from below a transverse ridge which is situated just below the vertex, covered with a somewhat sparse white pubescence, and finely transversely striate in the centre; head, thorax, and first two abdominal segments of about equal width; head, when viewed from above, equal in size to pronotum; scutellum and postscutellum somewhat more coarsely punctured than the rest of the segments; abdomen as long as the head and thorax united, the 2nd segment with a median longitudinal carina, 3rd segment rounded at apex, with a conspicuous subapical row of foveæ. Dark blue, the clypeus bright green, the pronotum, mesonotum, scutellum and postscutellum, and a spot on the 3rd abdominal segment just above the subapical row of foveæ, green; the first abdominal segment, except the extreme base and a line on the centre above not reaching the apex, and the apical two-thirds of the 2nd abdominal segment bright coppery golden; second and following joints of flagellum of antennæ dark red; tarsi dark

testaceous, almost black; remainder of legs metallic green; wings hyaline, tegulæ dark blue, radial cell closed.

♂. Similar; the patch of blue on the 2nd abdominal segment not transverse, but somewhat wedge-shaped; no green spot on 3rd abdominal segment; antennæ light red below, except the first two joints, which are metallic green. Long. 6.5–9 mm.

Hab. Kashmir, 5000–6000 ft.; three specimens.

CHRYSIS KASHMIRENSIS, n. sp.

♀ ♂. Head closely and regularly, thorax somewhat coarsely punctured and rugose, abdomen with the first segment coarsely punctured, but not rugose, 2nd and 3rd segments finely punctured, especially at base of 2nd segment; the whole insect sparsely pubescent; clypeus slightly emarginate, and with a median carina; front not forming an angle with the vertex, and the puncturing little, if any, finer than on the remainder of head; head, when viewed from above, considerably larger than pronotum; abdomen nearly as long as head and thorax united; pronotum with a slight median depression; a hollow at the base of postscutellum; the 1st and 2nd abdominal segments with an ill-defined median carina; 3rd segment rounded, with subapical foveæ. Dark blue or blue-green; base of mandibles, clypeus and front, scape and first two joints of flagellum of antennæ, and the legs, except the tarsi, light metallic green; mandibles, remainder of flagellum of antennæ, and the tarsi, reddish black; abdomen below light metallic green, the base of the apical segment and two large basal maculæ on 2nd segment, reddish brown; wings hyaline, apex of fore wing with a very slight fuscous tinge, which is sometimes confined to the radial cell; tegulæ dark blue, finely punctured; radial cell of fore wing closed. Long. 9–10 mm.

Hab. Kashmir, 5000–6000 ft.; five specimens.

CHRYSIS QUÆRITA, n. sp.

♂. Rather stoutly built; head, thorax, and abdomen closely, but not very finely, punctured, and covered with a short, sparse, greyish pubescence; head about as wide as pronotum and, when viewed from above, subequal to it; abdomen not quite so long as head and thorax united, vertex overhanging the front, but with no distinct ridge between them; front concave, closely and finely punctured, and with stiff, somewhat sparse, white pubescence; pronotum with a median longitudinal depression; 3rd abdominal segment tri-sinuate, with subapical foveæ. Dark blue, with a greenish tint in some lights; front and scutellum light green; mandibles, antennæ, and tarsi black; wings hyaline, the radial cell subfuscous and closed. Long. 6 mm.

Hab. Deesa; a single example.

CHRYSIS ABUENSIS, n. sp.

♀. Head and thorax finely and rugosely, abdomen finely and closely punctured; a little short greyish pubescence on the cheeks and on 2nd and 3rd abdominal segments; front, basal half of antennæ, and legs with short white pubescence; head at least as wide as pronotum, and, viewed from above, about equal to it; abdomen about the

length of head and thorax united; clypeus convex, its anterior margin slightly concave; a conspicuous { -shaped carina in front of anterior ocellus, and the front below it slightly concave, finely and very closely punctured, the punctures running into striæ, and with a median longitudinal carina; a median longitudinal depression on the basal half of pronotum; 1st and 2nd abdominal segments with a trace of a median longitudinal carina, 3rd segment rounded posteriorly, with subapical foveæ. Dark blue; front, pronotum, and the centre of 1st abdominal segment green; scutellum and large lateral spots on 1st abdominal segment coppery golden; postscutellum bright greenish golden; scape and first two joints of flagellum of antennæ blue or blue-green, remaining joints and tarsi reddish black; fore wing subfuscous, hind wing hyaline, radial cell of fore wing closed.

♂. Differs only in having the vertex of the head green, and the mesonotum, and 2nd and 3rd abdominal segments of a greenish blue colour; the eyes are somewhat convergent below, not parallel, as in the female, and the joints of the antennæ are thicker and somewhat shorter. Long. 9-11 mm.

Hab. Mt. Abu; common in September and October.

CHRYSID CHAVANÆ, n. sp.

♀. Head and thorax closely but somewhat irregularly, abdomen rather more regularly and finely punctured; head wider than pronotum, the latter with sides almost parallel; 1st abdominal segment with a deep median longitudinal indentation at base, 2nd and 3rd segments with traces of a carina, apical segment without teeth, slightly sinuate. Head and thorax dark blue, the mesonotum with greenish reflections; abdomen light metallic green, with a coppery effulgence on 2nd and 3rd segments; legs dark blue; flagellum of antennæ piceous; tarsi dark red or reddish black; the whole insect more or less covered with rather sparse greyish pubescence; wings hyaline, fore wing with the central portion very slightly infuscated, nervures dark testaceous. Long. 6 mm.

Hab. Quetta; a single specimen.

(To be continued.)

ON THE BUTTERFLIES COLLECTED IN EQUATORIAL AFRICA BY CAPTAIN CLEMENT SYKES.

By EMILY MARY SHARPE.

(Continued from p. 280.)

35. *ACRÆA CÆCILIA* (a variety).—*a*, ♂. March from Usoga to Nandi; April, 1900.

This species has the black spots on the primaries larger, especially those at the end of the discoidal cell. The same thing occurs with the discal spots on the secondaries, the first three being black streaks; with the costal one united to the hind marginal border.

36. *A. PERENNA*, *Doubl. & Hewits.*—*a, b, ♂*. March from Usoga to Nandi; April, 1900.

37. *A. PHARSALUS*, *Ward.*—*a, b, ♂*. March from Usoga to Nandi; April, 1900.

38. *A. ZETES* (*Linn.*).—*a-c, ♂ ♀*. March from Usoga to Nandi; April, 1900.

39. *A. ASTRIGERA*, *Butl.*—*a, b, ♂ ♀*. Wadelai; January–March, 1900.

40. *A. EGINA* (*Cram.*).—*a, ♂*. March from Usoga to Nandi; April, 1900.

41. *A. LYCIA* (*Fabr.*).—*a*. Lamogi; November, 1899. *b, c*. March from Usoga to Nandi; April, 1900.

42. *PLANEMA ARCTIFASCIA*, *Butl.*—*a*. March from Usoga to Nandi; April, 1900.

43. *PARDOPSIS PUNCTATISSIMA*, *Boisd.*—*a, b*. Wadelai; January–March, 1900. *c*. March from Usoga to Nandi; April, 1900.

Family NYMPHALIDÆ.

44. *ATELLA PHALANTHA* (*Drury*).—*a, b*. March from Usoga to Nandi; April, 1900.

45. *A. COLUMBIA* (*Cram.*).—*a, b*. March from Usoga to Nandi; April, 1900.

46. *PYRAMEIS CARDUI* (*Linn.*).—*a*. March from Usoga to Nandi; April, 1900. *b*. Unyoro; March, 1900.

47. *ARGYNNIS HANNINGTONI*, *Elwes.*—*a, b*. March from Usoga to Nandi; April, 1900.

48. *VANESSULA MILCA*, *Hewits.*—*a*. March from Usoga to Nandi; April, 1900.

49. *HYPANARTIA* ? *DELIUS* (*Drury*).—*a*. March from Usoga to Nandi; April, 1900.

This specimen represents a melanistic phase, as the upper surface is entirely brownish black, the characteristic chestnut band on the primaries being obsolete, but distinctly indicated on the under surface, as are all the other spots and markings.

50. *H. HIPPOMENE*, *Hubn.*—*a*. March from Usoga to Nandi; April, 1900.

51. *JUNONIA CLELIA* (*Cram.*).—*a, b, ♂ ♀*. Wadelai; January–March, 1900. *c. ♀*. Lamogi; November, 1899.

52. *J. CEBRENE*, *Trim.*—*a, b*. March from Usoga to Nandi; April, 1900. *c*. Unyoro; March, 1900.

53. *J. BOÖPIS*, *Trim.*—*a, ♀*. Wadelai; January–March, 1900. *b, ♂*. March from Usoga to Nandi; April, 1900.

54. *J. WESTERMANNI*, *Westw.*—*a, b, ♂ ♀*. March from Usoga to Nandi; April, 1900. *c, ♂*. Unyoro; March, 1900.

55. *PRECIS SESAMUS*, *Trim.*—*a, b.* March from Usoga to Nandi; April, 1900.
56. *P. CALESCENS* (*Butl.*).—*a, b.* March from Usoga to Nandi; April, 1900.
57. *P. CŒLESTINA*, *Dewitz.*—*a.* March from Usoga to Nandi; April, 1900.
58. *P. ARCHESIA* (*Cram.*).—*a, b.* March from Usoga to Nandi; April, 1900.
59. *P. CERYNE* (*Boisd.*).—*a, b.* Wadelai; January–March, 1900. *c.* Unyoro; March, 1900.
60. *P. GALAMI* (*Boisd.*).—*a.* Unyoro; March, 1900. *b.* March from Usoga to Nandi; April, 1900.
61. *P. PELARGA* (*Fabr.*).—*a.* Wadelai; January–March, 1900. *b.* Unyoro; March, 1900.
62. *P. INFACIA* (*Butl.*).—*a.* Wadelai; January–March, 1900. *b.* March from Usoga to Nandi; April, 1900.
63. *P. TEREIA* (*Drury.*).—*a.* March from Usoga to Nandi; April, 1900. *b.* Unyoro; March, 1900.
64. *P. ORTHOSIA* (*Klug.*).—*a.* Wadelai; January–March, 1900. *b, c.* March from Usoga to Nandi; April, 1900.
65. *P. GREGORII* (*Butl.*).—*a-c.* March from Usoga to Nandi; April, 1900.
66. *CATACHROPTERA CLOANTHA* (*Cram.*).—*a, b.* March from Usoga to Nandi; April, 1900.
67. *PSEUDARGYNNIS HEGEMONE* (*Godt.*).—*a.* March from Usoga to Nandi; April, 1900.
68. *EURYTELA DRYOPE* (*Cram.*).—*a, b.* March from Usoga to Nandi; April, 1900.
69. *E. OPHIONE* (*Cram.*).—*a.* Unyoro; March, 1900.
70. *ERGOLIS ENOTREA* (*Cram.*).—*a-d, ♂ ♀.* March from Usoga to Nandi; April, 1900.
71. *BYBLIA ILITHYIA* (*Drury.*).—*a.* Lamogi; November, 1899.
72. *CRENIS OCCIDENTALIUM*, *Mabille.*—*a, b.* March from Usoga to Nandi; April, 1900.
73. *C. NATALENSIS*, *Boisd.*—*a, b.*—March from Usoga to Nandi; April, 1900.
74. *NEPTIS MAPESSA*, *Hopff.*—*a.* Unyoro; March, 1900.
75. *N. AGATHA* (*Cram.*).—*a, b.* March from Usoga to Nandi; April, 1900.
76. *PANOPEA LUCRETIA* (*Cram.*).—*a.* March from Usoga to Nandi; April, 1900.
77. *HAMANUMIDA DÆDALUS* (*Fabr.*).—*a, b.* Wadelai; January–March, 1900. *c, d.* March from Usoga to Nandi; April, 1900.
78. *HYPOLIMNAS MISIPPUS* (*Linn.*).—*a, b, ♂.* Unyoro; March, 1900. *c, ♀.* March from Usoga to Nandi; April, 1900.

79. *H. ANTHEDON*, *Doubl.*—*a*, ♂. March from Usoga to Nandi; April, 1900.

80. *H. MONTEIRONIS* (*Druce*).—*a*, ♀. March from Usoga to Nandi; April, 1900.

81. *SALAMIS ANACARDII* (*Linn.*).—*a*. March from Usoga to Nandi; April, 1900.

82. *S. CACTA* (*Fabr.*).—*a*, ♂. March from Usoga to Nandi; April, 1900.

83. *S. TEMORA*, *Feld.*—*a*. March from Usoga to Nandi; April, 1900.

84. *EURYPHENE THEOGNIS*, *Hewits.*—*a*, *b*, ♂ ♀. March from Usoga to Nandi; April, 1900.

85. *EUPHÆDRA UGANDA*, *Auriv.*—*a*. March from Usoga to Nandi; April, 1900.

86. *CYMOThOE LURIDA* (*Butl.*).—*a*, ♂. March from Usoga to Nandi; April, 1900.

87. *EUXANTHE CROSSLEYI* (*Ward*).—*a*, ♂. March from Usoga to Nandi; April, 1900.

88. *E. ANSELLICA* (*Butl.*).—*a*, ♂. March from Usoga to Nandi; April, 1900.

89. *CHARAXES CASTOR* (*Cram.*).—*a*, *b*. March from Usoga to Nandi; April, 1900.

90. *C. LICHAS* (*Doubl. & Hewits.*).—*a*. March from Usoga to Nandi; April, 1900.

91. *C. NUMENES* (*Hewits.*).—*a*, *b*, ♂ ♀. March from Usoga to Nandi; April, 1900.

92. *C. TIRIDATES* (*Cram.*).—*a*, *b*, ♂. March from Usoga to Nandi; April, 1900.

93. *C. KIRKII*, *Butl.*—*a*, *b*, ♂. March from Usoga to Nandi; April, 1900.

94. *C. ETHEOCLES* (*Cram.*).—*a*, *b*, ♂. March from Usoga to Nandi; April, 1900.

95. *C. ETESIPE* (*Godt.*).—*a*, ♀. March from Usoga to Nandi; April, 1900.

96. *C. EPIJASIVS*, *Reiche.*—*a*, *b*, ♂. Wadelai; January–March, 1900.

97. *C. POLLUX* (*Cram.*).—*a*. March from Usoga to Nandi; April, 1900.

98. *C. VARANES* (*Cram.*).—*a*, *b*. March from Usoga to Nandi; April, 1900.

(To be continued.)

ON SOME NEW GENERA AND SPECIES OF HYMENOPTERA (ICHNEUMONIDÆ, CHRYSIDIDÆ, FOSSORES, AND APIDÆ).

By P. CAMERON.

(Continued from p. 264.)

AMPULEX BREVICORNIS, sp. nov.*

Cæruleo-viridis; antennis tarsisque nigris; femoribus posterioribus rufis; alis fusco-violaceis. ♀. Long. 23–24 mm.

Hab. Khasia (coll. Rothney).

Antennæ short, stout, about twice the length of the head; black, opaque; the third and fourth joints equal in length; the fourth to sixth joints incised at the base beneath. Head shining, smooth, except for a few large deep punctures above each antenna; each puncture bears a long hair. Eyes converging slightly above, the width separating them being about the length of the basal three joints of the antennæ united. The apex of the clypeus is largely depressed, the depression becoming gradually wider towards the apex, which is not toothed; backwards the keel extends to the base of the antennæ. Antennal tubercles stout; there is no keel over the antennæ; behind the head is developed to a greater length than the length of the eyes. The apical part of the prothorax is broader than long, the sides almost straight; its basal half bearing large deep distinctly separated punctures, and with a narrow distinct longitudinal furrow. The basal half of the mesonotum, except in the middle, bears large deep clearly separated punctures, and is covered with long black hairs; the middle has a distinct furrow, extending from the base to near the apex. The scutellum has a row of punctures round the sides and apex, as has also the post-scutellum. There is no central keel on the median segment, except at the extreme base; the inner lateral lines form a large triangle, which is distinctly striated; the basal striæ are slightly oblique, and arise from the centre; the apical ones go right across; at the apex the keels are waved and reach to the apex. The apex has an almost perpendicular slope, is smooth at the base, the rest with curved striations, which are finer on the inner side. The propleuræ smooth; the middle under the keel striated at the apex. Mesopleuræ smooth, the upper and apical parts striated; the lower middle part more finely and closely striated. Mesosternum smooth, sparsely pilose; the furrow keeled in the middle. The mesonotum at the base and sides and the greater part of the median segment are more or less indigo-blue. There is no distinct tooth on the apex of the median segment, only the second keel on the metapleuræ projects slightly. The anterior femora blue; the

* This species has the basal ventral segments formed as with *Ampulex assimilis*, Kohl, from Guinea, and figured by him (Annal. d. k.k. Natur. hist. Hof. Mus. Wien, viii. pl. xii. f. 38), and not as in *A. cognata*, fig. 34, i. e. the lower side is roundly curved and incised at the apex, somewhat as in *A. latifrons*, but not roundly dilated at the apex as in that species (cf. Kohl, l. c. f. 43). The apical half, too, of the clypeus is cleft, not the apical third, as in *cognata*.

tibiæ and tarsi blackish; the apex of the tibiæ rufous. The four hinder femora are red, blackish at the extreme apex; the trochanters, tibiæ, and tarsi black; the end joint of the tarsi with a heart-shaped dilatation, which reaches to the middle of the joints; the claws bifid. Wings fuscons-violaceous; the appendicular cellule is open; the apex of the radial nervure is united to the nervure bordering the radial cellule, not received in front of it as in *A. latifrons*; the two abscissæ of the radius are equal in length; the first recurrent nervure is roundly curved from top to bottom, and is received shortly beyond the middle; the second has three slight curves, and is received before the middle of the cellule. The cubital nervure in the hinder wings is interstitial. Abdomen smooth and shining, blue; the apices of the segments piceous. The narrowed part of the petiole as long as the widened apex; the second segment is as long as the succeeding united.

Allied to *A. latifrons*.

TRYPOXYLON GENICULATUM, sp. nov.

Nigrum, trochanteribus tarsisque anterioribus, tibiis anticis basique tibiæ posticarum testaceis; alis hyalinis, stigmate nigro; abdominis medio rufo. ♀. Long. 13 mm.

Hab. Khasia (Coll. Rothney).

Antennæ black, the second joint rufous beneath; the scape and flagellum almost bare. The face and clypeus thickly covered with silvery pubescence; the front and vertex almost bare, finely punctured and opaque; below the ocelli is a shallow, but distinct, furrow; below this furrow is a stout keel, with oblique sides. Mandibles rufous; the palpi pale testaceous. Mesonotum shining, plumbeous; distinctly, but not strongly, punctured all over. The middle depression on the base of the median segment is wide, shallow, narrowed at the base, and finely transversely striated; the lateral furrows are wide, slightly narrower and deeper than the middle one, and striated like it; the apex of the segment has an oblique slope; its furrow is deep, with oblique sides; its apical half transversely striated. Pleuræ smooth and shining; the tubercles have a thick hair fringe behind; the furrow on the base of the mesopleuræ deep; the central fovea large, round. Mesosternum closely and finely punctured; the central furrow wide. Legs black; the anterior tibiæ and tarsi, all the trochanters and the four posterior knees, rufo-testaceous. Wings clear hyaline; the stigma and nervures black. Abdomen black; the apices and sides of the second and third segments rufous; the petiole is slightly longer than the second and third segments united; its base is distinctly channelled above; its apical fourth is dilated.

TRYPOXYLON TROCHANTERATUM, sp. nov.

Nigrum, abdomine rufo, petiole nigro; alis hyalinis, stigmate nervisque fuscis. ♀. Long. 12 mm.

Hab. Khasia Hills (Coll. Rothney).

Antennæ black, covered with a short pile. The face, the eye incision, and clypeus thickly covered with silvery pubescence; the clypeus projecting broadly in the middle and at the apex, where it is

smooth, shining and glabrous. Mandibles rufous, sparsely covered with long pale hair; the palpi rufo-testaceous. Front and vertex opaque, the front finely and closely punctured; the upper half with an indistinct furrow down its middle; the lower half keeled in the middle; the upper half of the keel distinctly furrowed in the centre. Thorax opaque; the pleuræ and apex of the median segment covered with silvery pubescence; the base of pronotum on the top raised; the raised part dilated laterally. The base of the median segment longitudinally striated; the rest of the basal region closely transversely striated; the central depression wide, not much widened towards the apex; the apex of the segment has an oblique slope, and has a narrow, deep furrow down the centre. Pleuræ smooth, the mesopleuræ covered with silvery pubescence. Legs black; the trochanters, the tibiæ in front, the anterior tarsi, the spines, and the claws rufous. Abdomen rufous; the petiole black, except at the apex; it is as long as the second and third segments united; the apical half is distinctly wider than the basal, which is furrowed down the middle; on the apex of the second segment is a small black mark; on the third a larger cleft mark.

VESPIDÆ.

ZETHUS QUADRIDENTATA, sp. nov.

Deep black; the mandibles broadly lined with pale yellow in the middle; wings fuscous-violaceous, paler at the base; the tegulæ bright red; apex of mandibles with two sharply pointed teeth in the middle, and a broader, blunter one on either side. ♂. Long. 15 mm.

Hab. Borneo.

Antennæ black, distinctly thickened towards the apex; the last joint brownish below; the hook long, curved, stout. Head closely, rugosely punctured; thickly covered with pale fuscous pubescence, which is longest on the front. Clypeus broader than long, sparsely punctured and thickly covered with long fuscous hair; its apex is broadly rounded; the teeth are only distinctly visible when looked at from below. There is a narrow reddish line on the pronotum near the tegulæ, where it is less strongly punctured than elsewhere. Mesonotum shining, not strongly punctured, the apical half less strongly than the base; the furrows extend from the base to the apex; they are deep and smooth. Scutellum punctured, but not deeply or closely; there is a short, deep longitudinal furrow on the apex behind; the post-scutellum is more strongly punctured than the scutellum; its sides are bordered by a distinct raised keel. The central part of the apical slope of the median segment is bordered laterally by a stout keel; between the two is a shorter broad keel; the enclosed space is coarsely transversely striated; the outer side and the apex of the metapleuræ coarsely reticulated. The middle of the propleuræ bears some stout keels; the apex is smooth, with a row of punctures on the lower edge. The upper part of the mesopleuræ is more strongly punctured than the lower, and there is a longitudinal punctured furrow in the middle; the apical two-thirds of the upper part of the metapleuræ are strongly obliquely striated. Legs black, thickly covered with pale pubescence; the knees and calcaria pale. Wings fuscous-

violaceous, the stigma and nervures black; the top of the second cubital cellule is not much more than half the length of the space bounded by the recurrent nervures. The petiole is coarsely rugosely punctured; on the sides the punctuation is coarser, more irregular, and running into reticulations.

(To be continued.)

MISCELLANEA RHYNCHOTALIA.—No. 5.

By G. W. KIRKALDY, F.E.S.

(Concluded from p. 284.)

LÆMOCORIS POSEIDON, sp. nov.

Allied to *L. costæ*, Reuter, but the latter has much smaller eyes.

Clothed with sparse white pubescence. Head, pronotum, and scutellum blackish. Elytra brownish, basal third of corium (base itself excepted), a large spot on the costal margin near the apex, not reaching to the claval or membranal margin, whitish. Membrane fumate, iridescent. Antennæ brownish white, basal half of the first segment blackish brown, apical half dirty whitish. Beneath pale brownish, apex of coxæ and the rostrum whitish. Lateral margins of the sterna blackish. Eyes very large, occupying the greatest part of the head (in profile). Rostrum reaching well beyond posterior coxæ; second segment of antennæ one-fifth longer than the third, more than three times as long as the first, the latter reaching a little in front of the head. Vertex scarcely wider than an eye. Base of pronotum one-half wider than the head and eyes, twice as wide as the eyes together. Long. 3.2 mill. (with elytra), 2.5 mill. (to apex of abdomen), lat. 1 mill.

Hab. GUINEA, Addah (ex coll. Montandon).

LÆMOCORIS (?) RAVENAR, sp. nov.

Clothed with fairly long, somewhat bristly, yellowish hairs. Head, pronotum, scutellum and under side, antennæ, rostrum, &c., pale flavous. Elytra pale olivaceo-flavous, a whitish band across elytra at apex of clavus, and a large whitish spot at apex of corium, not reaching to interior margins. Head (in profile) twice as long as the thickened first antennal segment, vertex a trifle wider than the eyes together. Rostrum reaching to apex of posterior coxæ. Second segment of antennæ three times as long as the first, one-sixth longer than the third. Long. 3 mill. (including elytra), lat. $\frac{5}{8}$ mill.

Hab. JAVA (ex coll. Montandon).

SHANA, gen. nov.

Belongs to *Capsaria*; distinguished from *Polymerus*, Reuter, and *Pæciloscytus*, Fieber (to which it is remotely allied) by the very distinct stink-orifices; from *Charagochilus* by the slender collar and the length of the tarsi.

More or less punctured: clothed with pallid pubescence. Head smooth, polished, declivous, longer than high; width of vertex with eyes equal to twice the length of the first antennal segment. Vertex strongly and entirely marginate at base. Eyes oblique. Clypeus not very prominent. Pronotum at base nearly twice as wide as head, collar short, not as wide as the vertical margination. Pronotal callosities subconfluent, behind these the pronotum is punctulate; lateral margins somewhat rounded, not reflexed. Lateral margins of elytra ampliate, wider near the apex than the cuneus, fracture of the latter deeply marked; cuneus nearly isosceles, or a trifle wider than long. Posterior femora not strongly incrassate, reaching a little beyond apex of abdomen, tibiæ long and slender. Third segment of posterior tarsi longer than either first or second, second longer than first.

S. RAVANA, sp. nov.

Apex of head, two basal antennal segments, base of pronotum, scutellum, elytra, femora and base of tibiæ, underneath, black or brownish black. Remainder of head and pronotum reddish testaceous. Legs pallid fuscous. Stink-orifices pallid. Membrane fumate. Abdomen beneath smooth and polished. Second segment of antennæ three times as long as first, apical two-thirds incrassate a little, two and one-third times as long as the slender third segment. Rostrum reaching posterior coxæ. ♀. Long. 5 mill.

Hab. BIRMA, Chan Yoma (ex coll. Montandon).

Fam. LYGEIDÆ (= COREIDÆ, olim).

ACANTHOMIA TOMENTICOLLIS (Stål, sub. *Clavigralla*, 1855)
= *tomentosicollis* (Stål, 1865).

Fam. TETIGONIIDÆ.

HARMONIDES, n. n. for *Parmula*, Fairm., nec Heyd., 1825 (Mollusca).

AGONDAS, n. n. for *Janthe*, Stål, nec Marseul, 1865 (Coleoptera).

THE PUBLICATION-DATE OF THE RHYNCHOTAL PART OF THE 'VOYAGE OF THE COQUILLE.'

By G. W. KIRKALDY, F.E.S.

WHEN preparing the first part of my work "On the Nomenclature of the Genera of the Rhynchota" (Entom. 1900, p. 25 *et seq.*), I was able to examine only a separate copy of the Rhynchotal portion of Duperrey's 'Voyage autour du monde sur la Coquille.' This was dated 1830, and as the work was cited by Laporte in 1832, and Boisduval in 1835, I did not question its correctness. Lately, however, I have been able to examine the whole work, and find that I was led into grievous error. The title-page of the zoological part, vol. ii. pt. 2, division 1, bears the date

1830, but the 'Avant-propos' is subscribed Nov. 15th, 1838, by Guérin Méneville, and this year is the actual date of the text, as is seen by a reference to the lepidopteral portion (p. 271, not 171, as stated in the 'Avant-propos'), where Guérin mentions the dates of publication of the various "livraisons" of the Atlas. Plates x.-xii. (Rhynchota) were published in 1831, but the text not till 1838. It may be noted that Hagen ('Bibliotheca Entom.') cited 1829-32 as the date, but had not seen the work. The references in Laporte and Boisduval are to the plates only. According to Guérin, the second volume, by Boisduval, of the 'Voyage de découvertes de l'Astrolabe' was published May, 1835.

This will unfortunately necessitate some slight alterations in my "Nomenclature," which will be effected at the end of part 1, now in the press.

WHAT IS MONOPHLEBUS, LEACH?

By T. D. A. COCKERELL.

IN Entom., September, 1902, p. 232, I gave an account of *Monophlebus* which I supposed would not need correction. Since then, however, some facts have developed which call for a reconsideration of the whole matter.

(1.) Mr. G. W. Kirkaldy wrote me that *Monophlebus* did not date from Westwood's publication, but from Burmeister, Handb. ii. p. 80, published in 1835. It is also to be remarked that Westwood's paper dates not from 1845, but from 1842 (*fide* Kirkaldy) or 1841 (according to a date pencilled by M. Wytzman on the copy before me).

(2.) The question arose, however, whether Leach himself published *Monophlebus* at any earlier date. Prof. C. H. Fernald has exhaustively investigated this matter, with the following principal results:—

(a.) Agassiz's 'Nomenclator Zoologicus' cites "*Monophlebus*, Leach, Probos. Ins. 1817." This doubtless refers to *Eprobos*. Ins. (Wern. Soc.), but Professor Fernald has examined this work, as well as several others by Leach, and finds no reference to *Monophlebus*. It seems very improbable that Leach ever published the genus. Samouelle's 'Compendium,' 1819, has no reference to *Monophlebus*.

(b.) Latreille ('Familles Naturelles du Règne Animal,' p. 429, 1825) published a genus "*Monophlebe*," with characters derived from the male antennæ. This name being only in the vernacular has no standing, but in 'Dictionnaire Classique d'Histoire Naturelle,' vol. ii. p. 99, published in 1827, the name is published as *Monophlebus*. The male antennæ are said to be moniliform, and of about 22 joints, which is an error known to have resulted from counting each joint as two, some as more.

So far, however, no really distinctive character had been given, and no type had been cited.

(c.) In Cuvier's 'Règne Animal,' edition of 1829, vol. v. p. 232, the genus is called *Monophleba*, is said to be of Dr. Leach, and we are informed that it is based on an insect from Java, with antennæ of about 22 joints, very hairy, and having thick and almost coriaceous wings. Still, however, the type is unnamed.

(d.) Next we come to Burmeister, as cited above. Here the genus is properly introduced, and the first species is *M. atripennis*, Klug, from Java. It does not appear that Klug himself ever published *atripennis*, but there is every reason to suppose that it was the species known to Leach and others, and made the type of the MS. genus *Monophlebus*. *M. dubius* (Fabricius) was from Sumatra.

(3.) On all grounds, therefore, *M. atripennis* is the type of *Monophlebus*. This species, along with *M. dubius*, is placed by me (*loc. cit.*) in a section characterized by having only two fleshy caudal appendages. No female of this section has been described, but we have assumed that the female must be similar to that of the other sections.

(4.) This assumption, however, proves to be unwarranted. Prof. C. H. T. Townsend has lately discovered a new form of *Icerya* (*Icerya littoralis* var. *tonilensis*, Ckll.) at Tonila in Jalisco, Mexico. He sent me both sexes, and the male reached me alive, having hatched *en route*. *This male has two long hairy fleshy crimson processes at the end of the abdomen*, nearly as long as the abdomen. The female has the regular *Icerya* ovisac, well-ribbed, suffused with yellow at the base.

(5.) Since it is consequently just as probable (to say the least) that the females of *Monophlebus atripennis* and *M. dubius* pertain to the *Icerya* group as that they belong to what we have called *Monophlebus*, we find ourselves in a dilemma. I am not yet prepared to use *Monophlebus* in place of *Icerya*; or of a section of *Icerya* containing males with long caudal processes, which might be regarded as a valid genus, so as to save the well-known term *Icerya* for *purchasi*, &c. At the same time, we cannot safely use *Monophlebus* in the old sense. It seems best, on the whole, to provisionally recognize several genera, as follows:—

(a.) *Monophlebus*, with *M. atripennis*, *M. dubius*, and *M. (?) littoralis* (*Icerya littoralis*, Ckll.). The last I will still call an *Icerya*, pending new evidence from the Malay Archipelago.

(b.) *Tessarobelus*, with *T. guerinii*, Montr., and *T. championi* (Ckll.).

(c.) *Llaveia*, with *L. axin* (Llave) and *L. saundersii* (Westw.).

(d.) *Drosicha*, with *D. contrahens* (Walker), *D. maskelli* (Ckll.), *D. leachii* (Westw.), *D. burmeisteri* (Westw.), *D. corpulenta* (Kuwana), *D. crawfordi* (Maskell).

(e.) *Monophlebulus*, with *M. fuscus* (Mask.).

This unfortunately leaves several species, known only in the female, unclassified. So far as known, the female of *Monophlebus* has 7-jointed antennæ, of *Drosicha* 9-jointed, of *Tessarobelus* 10-jointed, of *Llaveia* 11-jointed; but it is by no means certain that these characters are severally always associated with particular forms of male. Mr. E. E. Green (*in litt.*) tells me that his *Monophlebus zeylanicus* belongs to *Sasakia*. Several American species must for the present be treated as *Llaveia*; viz. *L. cacti* (L.), *L. bouvari* (Sign.), *L. uhleri* (Sign.), *L. primitiva* (Townsend), *L. mexicanorum* (Ckll.). *Monophlebus fortis* and *M. fulleri*, from Natal, may possibly go in *Llaveia*, but their males are much to be desired.

Monophlebus illigeri, Westw., and *M. raddoni*, Westw., are known only in the male; they have numerous short lateral abdominal processes. They come nearest to *Drosicha*, but their position is doubtful.

I am very greatly indebted to Professor Fernald for kindly communicating the results of his bibliographical researches.

East Las Vegas, New Mexico, U.S.A.: Sept. 30th, 1902.

P.S.—I have been trying to see whether any generic characters could be found in the larvæ of what has been called *Monophlebus*. Unfortunately very few larvæ are known, and, so far as I can see, these do not afford any good generic characters. They may be separated as follows:—

- Long hairs all round the body; antennæ 6-jointed, but the suture between 3 and 4 indistinct, 4 much longer than 3 *crawfordi*.
 Long hairs on the last seven segments; antennæ 6-jointed, 3 and 4 equal *axin*.
 Long caudal hairs, but relatively short hairs round the body 1.
 1. Long caudal hairs four; antennæ 6-jointed, 4 shorter than 3 *serratulæ*.
 Long caudal hairs two; antennæ 5-jointed (*vide* Maskell) 2.
 2. With very long brittle glassy threads; legs relatively longer *fuscus*.
 Without such threads; legs relatively shorter *maskelli*.

ON THE PARENTAL CARE OF THE CIMICIDÆ (RHYNCHOTA).

By G. W. KIRKALDY, F.E.S.

WRITERS have often cited a species of Acanthosomatinae as one of the few known instances where insects display parental care for their young. The original observations of De Geer were confirmed by Hellius, and have been reproduced or quoted in most entomological text-books. This habit is, however, probably not

exceptional among the Cimicidæ, for I have recently found a similar reference in the 'Ann. Soc. d'Agriculture de Lyon,' 1855 (2), vii. p. 91, where Montrouzier, in dealing with the bugs of Oceania, writes:—"The habits of the Scutellerines are interesting. Many deposit their eggs on the under surface of leaves out of reach of the rain, covering them with their body, and when they are hatched, lead their young ones, looking after them until they have acquired their wings. Their numerous family is seen following them along the trees, and crowding close to them at the least danger." I have also examined specimens sent to me in spirits of a species of *Spudæus* (?), which seem to show similar signs.

NOTES AND OBSERVATIONS.

FOOD-PLANTS OF THE LARVA OF *CNEPHASIA SINUANA*, Stph.—Temporary separation from my library prevented me from penning an answer to Mr. A. Thurnall's note (*ante*, p. 265) in time for insertion in the November number of this magazine. When writing my paper on the life-history of *Cnephasia sinuana*, Stph., which was published in the Ent. Mo. Mag. ser. 2, x. 105-6 (1899), I was fully as aware as he is that the two totally distinct species—*sinuana*, Stph., and *pasivana* (*rectius pascuana*), Hb., had formerly been often confused together, and that their names had erroneously been used as synonymous by various writers, as, for instance, by Mr. G. Elisha in 1879. But since, in 1891, I had had some detailed correspondence with Mr. Elisha about his experience with these two species, and had specially guarded against any possibility of confusion or misunderstanding about them, my assertion, in the paper alluded to above, that he had bred *sinuana* from larvæ in flowers of *Chrysanthemum leucanthemum*, rested upon the clearest possible proof of the fact (*viz.* upon Mr. Sang's identification of the bred moths, as there mentioned), short of having actually seen with my own eyes the specimens in question. Moreover, Mr. Thurnall, in the same note in which he questions my statement, himself admits that that statement is beyond question, as the following facts will show. He says (*ante*, p. 265), "If the late Mr. Sang saw the specimens which were bred from *C. leucanthemum* and pronounced them to be *sinuana*, Stph., I of course must bow to his decision . . ."; whilst in my paper in the Ent. Mo. Mag. (*l.c.*), to which I referred Mr. Thurnall (*ante*, p. 194), I had, more than three years previously, clearly stated, on p. 105, that "His specimens (*i.e.* the specimens of *C. sinuana*, Stph., bred by Mr. Elisha from flowers of *Chrysanthemum leucanthemum*, as the context most plainly shows) were identified by the late Mr. J. Sang, who knew the true *sinuana* well."—EUSTACE R. BANKES; Norden, Corfe Castle, Nov. 17th, 1902.

PLUSIA MONETA IN ENGLAND.—I was interested in Mr. Lawrance's note on *P. moneta* (*ante*, p. 242), but I do not share his pessimism. My opinion is that it has come to stay, and I should not be surprised to hear that other Continental species which come to light should turn up also. My reason for thinking this is that *Porthesia chrysorrhæa*,

which is very plentiful on the French coast, has turned up at New-haven, Folkestone, Dover, Margate, and Harwich, where there are fast steamer services running. The vessels load alongside a pier or wharf, where there are bright electric lights or incandescent lamps, and what is to stop an impregnated female flying on board, and getting carried over? This, I think, also applies to *Ennomos autumnaria* on the south-east coast, and *Callimorpha hera* in Devon. *P. chrysorrhæa* is now rapidly spreading over the South of England, through the medium of the hawthorn hedges on the railway banks, and has been taken as near London as Bromley.—C. W. COLTHURP; 127, Barry Road, East Dulwich, S.E.

HAWK MOTH PUPATING ON TREES.—Referring to Mr. F. P. Dodd's note relative to the above (*ante*, p. 73). I am able to give the name of one sphingid that does the same here; this is *Nephele variegata*. In almost every instance the larva spins up in the leaves and between the small branches of the fig-tree. The cocoon, too, is very thick for this species of moth. Out here it is undoubtedly done for protective purposes, as on the few occasions when I have found a few where the ground and an exposed root of the tree has been used for pupation, the pupæ have nearly always been eaten by ants. The ants seem to commence the attack directly the change takes place, and when the pupa-case is soft, as I have ascertained by experiment that they will not attack a perfectly dry pupa of this moth. The pupa is very active indeed, and when it is touched rolls itself completely round and round, and then gives a series of jerks for some time afterwards. It is very common here, and I have found as many as seventeen on one tree, but they were very badly ichneumonised. I have also found pupæ of *N. variegata* in holes of trunks of the trees, and, when so placed, the larvæ had carefully spun a thick web over the opening. This moth always emerges from the pupa between 10 and 12 p.m., and flies at dawn, feeds at the flowers of honeysuckle, and is the swiftest flier I know of for its size.—G. F. LEIGH; Durban, Natal.

LYCÆNA CORYDON, AB.—In the note on this aberration (*ante*, p. 284), the sex symbol was accidentally omitted. The specimen is a female.

VANESSA URTICÆ, AB.—Early in September this year I obtained a well-marked variety of this butterfly, differing from the ordinary type in the following particulars:—It is somewhat small in size; the two outer blotches on the costal margin of the fore wing are confluent; the two black spots near the anal angle are absent; the hind wings are entirely black, and there is no trace of blue on the wings whatever. In fact, it seems to correspond to the third variety figured in Newman's 'British Butterflies.'—B. L. MIDDLETON; Mullingar, Ireland, Oct. 27th, 1902.

[Somewhat similar aberrations of *V. urticæ* are figured in the 'Entomologist' for 1896, p. 73, and 1900, pl. iii. fig. 1; see also Entom. xxxiii. p. 103.—ED.]

CHRYSOPHANUS DISPAR, Haw.—Will lepidopterists who possess specimens of this species kindly communicate with J. R. Charnley, F.E.S., Howick House, Preston, Lancs., who states that he is endeavouring to find out how many specimens of British *C. dispar* there are in existence.

PROFESSOR ROBERT WALLACE is preparing for publication the 'Reminiscences' of the late Miss E. A. Ormerod. This was the work of her later days, and was enjoyed by her as a relaxation from the more arduous labours of Agricultural Entomology. Although the Autobiography was not completed, yet there is much material of a very interesting character on which to work. Professor Wallace would be glad to receive such letters from Miss Ormerod as her correspondents may deem of sufficient importance, together with any other information which they think will be of interest to the general public. His address is The University, Edinburgh.

CAPTURES AND FIELD REPORTS.

COLIAS EDUSA IN THE NEW FOREST.—About Aug. 14th last I saw a specimen of *C. edusa* flying across Butt's Lawn, near Brockenhurst, and a friend saw one in the same place a day or two later.—E. C. ANSORGE; Bedford Park.

COLIAS EDUSA IN KENT IN 1902.—I took fine specimens of *C. edusa* at Margate, between Aug. 23rd and 30th; one example was seen flying over Peckham Rye on Sept. 8th; and at Deal, on Sept. 9th, I saw two specimens.—C. W. COLTHRUP; 127, Barry Road, E. Dulwich, S.E.

VANESSIDÆ IN 1902.—*Pyrameis cardui* was by far the most plentiful Vanessid in the Isle of Thanet; it abounded in every clover or lucerne field. I noticed only a few *Vanessa urticae*, and but one specimen of *V. atalanta*.—C. W. COLTHRUP.

AGROTIS CINEREA.—I captured a specimen of this insect, at sugar, on the Sussex downs, in June last.—C. W. COLTHRUP.

DASYCAMPA (ORRHODIA) RUBIGINEA.—From the egg my kind friend Mrs. Fogden, of Apuldrum, near Chichester, skilfully reared to the pupal stage about a dozen *O. rubiginea*, which she most generously handed over to me in the flower-pot in which the larvæ pupated. The first of these beautiful "chestnuts" emerged on Oct. 9th, another on the 13th, another on the 14th, one on the 21st, one on the 22nd, another on the 28th—six fine specimens up to the time of writing. It is somewhat singular that one only emerged on each occasion.—JOSEPH ANDERSON; Chichester, Oct. 29th, 1902.

ENNOMOS EROSARIA AND HIMERA PENNARIA.—On Oct. 10th last I took a specimen of *E. erosaria* on a gas-lamp in this district. *H. pennaria* has been exceedingly abundant in this locality; I counted no less than sixteen in an evening's walk on Oct. 29th last.—H. G. FAYE; 3, Maryland Road, Bowes Park, N., Nov. 5th, 1902.

DEILEPHILA LIVORNICA IN SOUTH DEVON.—Mr. J. Jäger (*ante*, p. 287) records the capture of the larva of *D. livornica*, and says, "I am told that there is no record of this rare moth having been previously found in the larval state in Britain." If reference is made to the 'Entomologist,' vol. v. p. 169, it will be seen that it was obtained by me in 1870. I figured the larva, and the drawing is reproduced in Barrett's 'British Lepidoptera,' vol. ii. The same year Mr. Rickard obtained

nine larvæ and bred the moths; the larvæ were found on dock in a nursery garden in Plymouth (*vide* Entom. vi. 522), and fed up on the same.—G. C. BIGNELL; Saltash, Cornwall, Nov. 3rd, 1902.

PLUSIA MONETA NEAR TUNBRIDGE WELLS.—This insect made its appearance much later than was the case last year. On June 10th I went over to my old home at Bidborough (near Tunbridge Wells), to search for it upon the plants where I was so successful last year about the same date; but after a long hunt I only obtained three young larvæ, although they were in the chrysalis state at the same time last year. A fortnight later—June 24th—I revisited the garden, when upwards of three hours' search in the broiling sun produced three cocoons only. The experience was disappointing, to say the least of it, after having obtained three dozen or so the year before. The protective nature of these cocoons is very striking, for those which are placed upon the under side of the yellow withered leaves of the *Delphinium* are invariably of a beautiful golden colour, which exactly harmonises with the leaf, but if one of the larvæ be placed in a box it will usually spin a pure white cocoon.—H. W. SHEPHEARD-WALWYN; Dalwhinnie, Kenley, Surrey, Oct. 18th, 1902.

LATE APPEARANCES.—I was at Charmouth on Oct. 27th, and was surprised to find *Satyrus ianira* and *Nonagria lutos*a still out. However, I well remember taking bright and fresh specimens of the former at Ventnor, on Oct. 11th, 1868.—C. W. DALE; Glanvilles Wootton, Nov. 3rd, 1902.

GONEPTERYX RHAMNI IN NOVEMBER.—On Nov. 13th I saw, in the morning, near Horsley, Surrey, a specimen of *G. rhamni* on the wing, and tried to catch it, but without success. By its colour it appeared to be a male.—H. WOODGATE; Teddington.

DRAGONFLY IN LONDON.—Whilst walking along Queen Victoria Street on Sept. 29th last, I was surprised to see a species of *Æschna* (*cyanea*, I think), flying swiftly along the road. The weather was cold and dull at the time.—STANLEY A. BLENKARN; East Dulwich, Sept. 30th,

CERASTIS ERYTHROCEPHALA NEAR BOURNEMOUTH.—On Nov. 7th I took, at sugar, near Bournemouth, a fine male specimen of *C. erythrocephala*. Major R. B. Robertson had taken one also three weeks previously, about two miles away from my locality.—W. G. HOOKER; 125, Old Christ Church Road, Bournemouth, Nov. 30th, 1902.

CERASTIS ERYTHROCEPHALA NEAR BOURNEMOUTH.—Sugar has been giving better results lately. I took a fine *C. erythrocephala* on Oct. 14th last.—R. B. ROBERTSON; Pokesdown, Nov. 16th, 1902.

CAPTURES OF RARE TRICHOPTERA AT GLANVILLES WOOTTON.—*Hydropsyche ornatula*, McLach., one on Aug. 14th, 1900. *Trianodes conspersa*, Ramb., occasionally; I have also taken it at Torquay, and Mr. D. Cork used to meet with it in Dovedale. *Tinoides unicolor*, Piet., occasionally; I have also taken it at Ventnor. *Micropterna sequan*, McLach., one on Sept. 19th, 1901.—C. W. DALE; Nov. 3rd, 1902.

THE SEASON OF 1902.—The first entry in my diary for 1902 is the sight of *Gonepteryx rhamni* and *Vanessa urticae* on March 5th. On the

following day *V. polychloros* was first seen, and during the rest of the month the first and last named were very plentiful, *urtica* being seen in greater numbers during April than March. On April 17th a batch of larvæ of *Polygonia c-album* emerged from ova sent me from Yorkshire, and these fed up very well on elm. They pupated from May 26th till May 30th, and the resultant imagines appeared from June 8th till June 17th. The under sides of all were of the pale ochreous ground colour. On April 27th the first *Cyaniris argiolus* was taken, but this species was not nearly so common here this year as it was last. I took a good number of the second brood near St. Leonard's on August 15th, and noticed that these were much larger than the specimens of the early brood taken in Dorking. *Pieris rapæ* and *P. napi* began to appear during the first week in May, and many very small specimens of each were seen. On May 4th the first of a batch of forty *Melitæa cinxia* larvæ, which had been sent me from Ventnor about the middle of April, pupated, and they continued to do so till May 26th; but only fourteen reached the pupa stage, all the others being stung. I counted twenty-four cocoons of "ichneumons" that emerged from one larva, but about fourteen or fifteen was the usual number. They developed into little black flies. Thirteen imagines of *M. cinxia* came through successfully, but the fourteenth failed to develop its wings properly. The first appeared on June 15th, and the last on June 27th. On May 24th a good number of male *Euchloë cardamines* were seen, and from that date till June 22nd this species was very plentiful. On May 24th, also, *Nemeobius lucina*, *Hesperia malvæ*, and *Thanaos tages* were observed for the first time. The first-named was not nearly so abundant as it was last year, doubtless owing to the scarcity of sunshine; but a good number of ova were discovered on the under side of cowslip leaves, and I reared a few through to the pupa stage. The young larvæ began to appear on June 19th, but about sixty per cent. of them died before pupation. They took a long time to feed up, as it was well into August before the last one had changed. *Callophrys rubi* was first seen on May 24th, and several were taken from that date till the first week in June, but never in any numbers. *Pararge egeria* was taken on May 28th, on which date *Hesperia malvæ* was to be seen in profusion. *Chrysophanus phlæas* was seen on May 31st, but the early brood did not seem nearly so plentiful as that of August, when I found it quite common at Bembridge, in the Isle of Wight. *Pieris brassicæ* was first seen on June 2nd, and in August very fine specimens of this species were observed in great numbers at Bembridge and at St. Leonard's. *Lycæna icarus* was first noticed on June 4th, but, owing to the absence of sunshine, few were seen on the wing. Boxing off the long grass in the evening produced two fine varieties (*ante*, p. 218), one a gynandrous specimen, and the other having only one spot, besides the marginal ones, on the under side of each wing. A very small specimen was taken at Bembridge on Sept. 8th, and a single male was seen in the long grass on Oct. 7th. On June 8th *L. astrarche* was taken, and at Bembridge, during the latter part of August, several specimens, including one very small one, were caught. My experience with this insect is that it is never seen in any numbers, four being the most that I have ever taken at one time on the same ground. *L. bell-argus* was to be taken from June 8th till June 24th, after which date

the specimens seen were worn. This species, as well as *L. icarus*, and later on *L. corydon*, were caught far more plentifully this year in the evening than during the daytime. On June 9th hibernated specimens of *Vanessa cardui* were swarming on the shore near Bembridge, and the newly emerged insects could be taken in any number during the latter part of August. This was by far the commonest species of *Vanessa* observed this year, *V. io* being fairly plentiful, *V. urticae* rare at Bembridge, and *V. atalanta* far from common. On June 9th, and again in August, *Pararge megæra* was swarming. June 18th, which I have entered in my diary as "the first really fine day for weeks," was marked by the profusion of *Hesperia malvæ* and *Euchloë cardamines*, and by the fact that several females of *Nemeobius lucina* were seen ovipositing. I took one female and placed her in a pill-box with a cowslip leaf, and by the time I had reached home she had deposited twenty-four ova, some on the leaf and others on the box. On June 21st we found a large number of very fine larvæ of *Vanessa urticae*; they were so large that I took a few, which pupated the next day; and the resultant imagines, which emerged on July 3rd, are not only the largest but also the darkest specimens of this insect I have ever seen. Their markings, however, are quite normal. A larva of *Epinephele jurtina* (*ianira*), found by chance in long grass, pupated on June 22nd, and the imago appeared on July 9th. On June 24th *Lycæna alsus* was first taken, but this species was never plentiful in Dorking this year. On June 28th an imago of *Thecla w-album* emerged from the pupa; the larva was found on Boxhill, and pupated on June 10th. *Hesperia sylvanus* was first seen on June 28th, and from then till July 14th it was common on Ranmore. Some German larvæ of *Vanessa antiopa* began to pupate on July 8th, and the first imago appeared on July 24th. It was a curious variety, without a trace of the blue spots on the upper wings, and with only one small spot on each of the lower wings (*ante*, p. 285). The other specimens were quite normal. *Aphantopus hyperanthus* was taken on July 9th and following days, but was far from being as plentiful as in 1901. On July 12th *Hesperia thaumas* was first seen, and from then till the end of August was very common at Dorking, St. Leonard's and Bembridge. On July 12th, also, *Satyrus semele* was first noted, and some very good specimens were taken near the Culver Cliff, Isle of Wight, on Sept. 4th. On July 17th a female *Lycæna arion*, sent from Bude, deposited eight ova on wild thyme, but they produced no larvæ. Although I had made many attempts, I did not succeed in taking *Hesperia comma* this year till July 26th, and then I only obtained one specimen. Several were captured by others afterwards, but as I had to leave Dorking on the 28th, I was unable to go for it again. A fine larva of *Pieris brassicæ* pupated on July 27th, and a female emerged from it on Aug. 16th. *Epinephele tithonus* and, of course, *Canonympha pamphilus* were common, the latter from the beginning of July onwards, and the former from the beginning of August. On Aug. 29th I came upon a swarm of *Lycæna corydon*, but they had emerged some time, and it was difficult to find males in good condition, though the females were perfect. They were on a small patch of long grass close to the sea, by the Culver Cliff. I saw two specimens of *Colias edusa*, both males, on the shore by Bembridge

Point, one on Sept. 5th, and the other on Sept. 8th; but I had no net with me, so did not take them.

The above represents the bulk of my observations among the Diurni during the past year. Two facts seem to stand out prominently, when one looks back upon the season as a whole: the weather has been atrocious, and even moderate success has only been gained after unusually hard work; and nearly every species has been much later than usual in its time of appearance.—F. A. OLDAKER; Parsonage House, Dorking, Oct. 23rd, 1902.

NOTES FROM SHROPSHIRE.—*Asthena blomeri* was very common at Hopton Wagers, near Clevening Mortimer, during the first week of July last. It occurred only in some covers bordering a small stream, resting on the trunks of beech-trees; and I also beat it out of bramble-bushes growing amongst the trees. The part where it was to be found was only about three quarters of a mile long and about fifty yards wide. Other captures in July:—*Argynnis selenæ*, common in lanes; *A. euphrosyne*, *Pararge egeria*, *Thecla rubi*, *Lycana icarus*, *Syrichthus malvæ* (one), *Hesperia sylvanus*, *Zygana filipendulæ*, very common in some fields; *Dasychira pudibunda*, a few; one female laid several batches of eggs, from which hatched out over three hundred larvæ. *Thyatira batis*, caught last year, as also were *Charaxes graminis*, *Melanthia albicillata*, *Melanippe montanata*. *Triphæna pronuba* swarmed round laurel bushes in full bloom.—C. R. Y. BOXER; 151, Burnt Ash Hill, Lee.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—November 5th, 1902.—The Rev. Canon Fowler, M.A., D.Sc., F.L.S., President, in the chair.—Lieutenant T. Delves Broughton, R.E., of Alderney, Channel Islands; Mr. Arthur Percival Buller, of Wellington, New Zealand, and of the Inner Temple, E.C.; the Rev. Canon C. T. Cruttwell, M.A., of Ewelme Rectory, Oxfordshire; Mr. R. S. Hole, of the Rectory, North Tawton, Devon; and Mr. W. E. Sharp, of Ledsham, Shakespeare Road, Hanwell, W., were elected Fellows of the Society.—The Secretary informed the meeting that a request for certain alterations in the bye-laws, signed as required by Chapter 21 thereof, having been received by the Council, Mr. Arthur J. Chitty had been good enough to draft the necessary amendments. Mr. Chitty then read the proposed amendments, and explained the course to be taken to carry them into effect.—Mr. H. J. Elwes, F.R.S., exhibited, on behalf of Mrs. Mary de la Bèche Nicholl, a collection of butterflies made by her in February, March, and April, 1902, in Southern Algeria; also a collection of butterflies afterwards made by her in the Picos de Europa, in Spain; the latter collection comprised about eighty-five species, and was made in twenty-five days. Mr. Elwes remarked that these collections contained several interesting species of *Erebia*, *Lycana*, and other genera, and included three species not at present represented in the British Museum Collection.—Dr. Chapman exhibited, and made remarks on, two butterflies taken last July at Bejar, in West Central Spain, both notable as being very decidedly larger than any forms of the same species recorded from any other locality. He stated that one of them

belonged to a form of *Lycæna argus* (the *L. ægon* of the British list). They were taken about one and a half miles east or south-east of Bejar on July 9th and following days. He said that he proposed to name this form var. *bejarensis*.—Mr. R. South exhibited four specimens of a large form of *Cupido minima* (*Lycæna minima*) from Cumberland, sent to the Natural History Museum by Mr. Mousley, of Buxton. He also exhibited, on behalf of Mr. J. H. Fowler, of Ringwood, a series of *Lithosia deplana*, Esp., from the New Forest, showing interesting variations in both sexes, but especially in the females. It was stated that Mr. Eustace Bankes had recently recorded somewhat similar aberrations of the species from the Isle of Purbeck.—Mr. Hamilton Druce exhibited a specimen of *Limenitis populi*, L., caught whilst being chased by a small bird in July, 1901, near Riga, Russia; also a specimen of *Sesamia nonagrioides*, Lefeb., bred from a larva found feeding in the interior of a banana.—Mr. J. H. Carpenter exhibited a gynandromorphous specimen of *Lycæna icarus*, having the coloration of the male on the left side, and that of the female on the right side, captured on Ranmore Common, Surrey, in June last; also several aberrations of this species from Ranmore Common and the Isle of Wight. He also showed specimens of *Vanessa antiopa*, bred from German larvæ, including a remarkable aberration, in which the usual blue spots on the upper wings were entirely absent.—Mr. H. St. J. Donisthorpe exhibited a foreign specimen of *Quedius suturalis*, lent him by Mr. Keys, of Plymouth, and a British specimen taken by himself at Gravesend in 1891; also, for comparison, a specimen of *Quedius obliteratus* taken at Plymouth. He said that most of the specimens of so-called *Quedius suturalis* in British collections were really *Q. obliteratus*.—Mr. Pickett exhibited a remarkable series of *Angerona prunaria*, the result of four years' interbreeding between dark males from Raindean Wood, near Folkestone, and light-coloured females from Epping Forest; also unicolorous light orange-yellow males, light yellow females, dark orange males sprinkled with black, and other unusual aberrations.—Professor E. B. Poulton, F.R.S., exhibited a series of lantern slides prepared from negatives taken by his assistant, Mr. A. H. Hamm, of the Hope Department, and Mr. Alfred Robinson, of the Oxford University Museum. The slides represented a series of the larvæ and imagines of British moths photographed under natural conditions. Mr. Hamm's photographs of moths clearly showed the attitude of the insect in relation to the background which it had selected. Some of the species were shown upon their normal background of the bark of various kinds of trees, others upon lichen-covered stone walls. Mr. Robinson's photographs similarly represented the larvæ of species of British moths in their natural attitudes upon the food-plants. Prof. Poulton also showed a representation of the pupa of *Limenitis populi*, prepared from Portschinski's figure and description, and explained the highly ingenious hypothesis by which the appearances are accounted for by the Russian naturalist.—Mr. C. O. Waterhouse communicated a paper by Mr. L. R. Crawshay, entitled "On the Life-history of *Drilus flavescens*, Rossi."—H. Goss, *Hon. Sec.*

SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—October 23rd, 1902.—Mr. F. Noad Clark, President, in the chair.—Mr. Inglis, of Clapham, and Mr. Scollick, F.E.S., of Wimbledon, were

elected members.—Mr. South, on behalf of Mr. Fowler, of Ringwood, exhibited varieties of the female of *Lithosia deplana*: (1) grey in colour, with yellow costa extending to the fringe = var. *ochreata*; (2) with fore wings almost as yellow as *L. sororcula*, and the hind wings only slightly tinged with grey; they were from the New Forest. Mr. Tutt pointed out that variation in the Lithosiids took one of two directions, either a general darkening or an intensification of the yellow.—Mr. Dennis reported that on October 9th all stages of *Cyaniris argiolus* were to be found at Earl's Colne, Essex.—Mr. Turner, a number of examples of *Hydriomena furcata* (*Hypsipetes sordidata*) illustrative of local forms, and remarked upon the inconvenience caused by the continual change of the specific names.—Mr. B. W. Adkin, some remarkable forms of *Pachygastria* (*Bombyx*) *trifolii*, bred from larvæ taken on the Scilly Islands. One female was conspicuously light in colour, and the wedge-shaped markings of the fore wings of several males were much enlarged.—Mr. Lucas showed a number of lantern-slides illustrating (1) choice spots in the New Forest; (2) protective resemblance in insects; (3) various botanical characters of interest; and (4) some of the idiosyncrasies of collecting.

November 13th.—The President in the chair.—Mr. Colthrup exhibited a bred series of *Lymantria monacha*, originating from the New Forest, and exhibiting considerable black suffusion.—Mr. R. Adkin had had a number of larvæ from the same source, but the few imagines he bred were quite normal.—Messrs. Harrison and Main, long bred series of *Aglais* (*Vanessa*) *urticae* from Eastbourne, Delamere Forest, and Argyllshire, and contributed notes on the characters of the several races. Those from the last-named locality were generally darker.—Mr. R. Adkin, a series of *Lycæna corydon* from Eastbourne, taken between Sept. 18th and Sept. 25th, and called attention to the frequency of blue scaling in the females. He also showed melanic forms of *Acronycta menyanthidis* from Selby, Yorkshire.—Mr. H. J. Turner, (1) a bred series of *Hypsilophus marginellus* from Banstead Downs, he also reported it from the Roman Road, Mickleham; (2) a long and very varied series of *Padisca corticana*, taken on a wet day in July in Epping Forest; he referred to the exceedingly perfect protective resemblance exhibited by the species, as well as to the great range of variation; (3) a female *Pechypogon barbalis*, set to show the secondary sexual characters existing in the extreme development of tufts of hairs on the fore legs; and (4) two varieties of *Polyommatus icarus* from Banstead, one, a small male, with all the basal spots of the under side missing, the marginal markings very faint or suppressed, and only a few of the submarginal ocelli remaining; the second, a female, with much-enlarged ocelli on the submargin.—Mr. Kaye, a fine female variety of *Fidonia atomaria*, having the ground colour very light and much increased in area at the expense of the dark bands; and a series of *Tiliacea aurago*, bred from ova laid by the only female he had ever captured, at Worcester Park, Surrey.—Mr. H. Moore read a paper entitled "A Visit to the Forest of Arques (Dieppe)," and showed a number of species of insects of various orders in illustration. Perhaps the most interesting were a series of dark, small, and thinly scaled *Canonympha arcania*, no doubt indicative of the fact that here the species was near the limit of its area of distribution.—Dr. Chapman

read a paper entitled "On Inflation in Insects," summing up the results of more than thirty years' observation and experiment. In the discussions which followed, Mr. Tutt pointed out that the problem was as yet unsolved, why *C. arcania* and other species characteristic of very adjacent Continental areas were absolutely non-British.—HY. J. TURNER (*Hon. Rep. Sec.*).

BIRMINGHAM ENTOMOLOGICAL SOCIETY.—September 15th, 1902.—Mr. R. C. Bradley in the chair.—Mr. G. W. Wynn showed various Lepidoptera, including *Protoparce convolvuli*, taken at Hampton-in-Arden, September 28th, 1901; series of *Cymatophora duplaris* from Wyre Forest, Sutton, and Hay Woods, near Knowle; those from Wyre (a long series) were typical, with well-marked transverse markings and quite pale median bands; whilst those from Sutton and Hay Woods were all dark, and approaching a unicolorous character, the pale markings practically gone and the dark ones indistinct, one dark band beyond the middle being fairly distinct, and the others quite faint. He said others he had from Tamworth were also of this dark form, and suggested that it might be due to the neighbourhood of Birmingham to these three localities; also a fine variety of *Xanthia lutea* Strom. (*silago*, Hb.), from Hampton-in-Arden, which showed a broad intensified median band and an intensified costal spot near the base of the wings, and practically no other markings, the small spots being absent; also *Cymatophora octogesima* and other insects from Wyre Forest.—Mr. A. H. Martineau, *Volucella inanis* from Littleham, South Devon, where it was taken on rubus flowers on August 6th, 1902.—Mr. J. T. Fountain, *Charocampa elpenor* bred from larvæ found near Shirley in 1901; also a series of *Spilosoma menthastri* bred from a nearly unicolorous one; a few resembled the parent, and these, he said, appeared first.—Mr. R. C. Bradley, Aculeata from Barmouth, 1902: *Agenia variegata*, a good series of both sexes, taken in June and August; and *Sapyga 5-punctata*, a series with one male only, taken in June; both must have been common, but hard to take.—Mr. Colbran J. Wainwright, rare Tachinidæ: *Parexonista fimbriata* from Tan-y-bwlch, North Wales, 1901; and *Phytomyptera nitidiventris* from Bournemouth, 1901; both taken by Mr. R. C. Bradley.—Mr. W. H. Flint exhibited the following Lepidoptera:—*Drymonia chaonia*, a fine bred one from the Forest of Dean district; *Notodonta trepida*, found at Kingswood, just emerged; *Larentia cuculata* (*sinuata*) and *Acidalia rubiginata* (*rubricata*), one of each, from South Devon, between Marychurch and Newton Abbott; also three very fine varieties of *Larentia sordidata* (*elutata*) from the Forest of Dean, which showed a broad pale median band, with a broad dark hind marginal band, and a broad dark band before the median one; also *Sesia chrysidiformis* and *S. ichneumoniformis* from the Forest of Dean district; of the latter he showed a fine series, and said he had traced it to its headquarters, where he found it commonly flying over trefoils and other low-growing flowers; he could have taken two dozen a day easily; also a fine specimen of *Lycæna semiargus* (*acis*), which he took himself at Wolvey, in Warwickshire, in 1896. He did not recognize it till he got it home, but it is in fine condition and unmistakable; also a specimen of *Augiades comma*, said to have been taken in Warwickshire, near Stoneleigh, but needing confirmation.

October 20th.—Mr. G. T. Bethune-Baker, President, in the chair.—Mr. C. J. Wainwright showed a specimen of *Meriania argentifera*, Meig., a Tachinid new to Britain, taken by Mr. W. J. Lucas in the New Forest on April 30th last; also *M. puparum* for comparison.—Mr. W. H. Flint, various Lepidoptera: *Larentia unangulata* from Yardley and Hay Wood; *L. sordidata* (*elutata*), and *L. autumnalis*, Ström. (*impluviata*, Hb.), showing a great range of variation; *Boarmia repandata*, dark specimens, one from Sutton very black, but not suffused, the markings clear but all very dark grey, not brown; also others from Forest of Dean almost as black, and a dark one from South Yorkshire, which, however, was brown and not grey in colour; dark *Hybernia leucophaearia* from the Forest of Dean; *Lygris populata*, dark suffused specimens from near Glasgow; *Calymnia trapezina*, a very dark specimen from Sutton of a deep olive green, nearly black; *Hybernia marginaria*, nearly black suffused specimens from Sutton; *Larentia suffumata*, a suffused but not black specimen, also from Sutton. He pointed out that amongst these specimens were four species from Sutton with more or less tendency towards melanism.—Mr. H. Willoughby Ellis, a series of the Midland species of the coleopterous genus *Cercyon*, Leach; fourteen species out of the total of eighteen found in Britain occur near Knowle, including *granarius* and *quisquilius*.—Mr. J. T. Fountain, Lepidoptera, including *Mamestra serena* from Sutton, Knowle, Sparkbrook, &c.; *Dianthæcia nana* (*consersa*) from Jersey; *Eurymene dolabraria* from the Wyre Valley; &c.—Mr. G. W. Wynn, various Lepidoptera, including *Hylophila bicolorana* (*quercana*), two fine specimens taken in Wyre Forest on August 22nd last; *Agrotis neglecta*, one fine one taken at the same time and place; *Zeuzera pyrina*, a pair from Hampton-in-Arden taken *in cop.*, the female being quite double the size of the male; and *Metopsilus porcellus*, taken at Hampden-in-Arden on June 26th last.—COLBRAN J. WAINWRIGHT, *Hon. Sec.*

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.—The opening meeting of the winter session, held on October 13th, in the Royal Institution, Liverpool, was largely attended. In the unavoidable absence of the President, Mr. S. J. Capper, Dr. John Cotton, F.E.S., of St. Helen's, occupied the chair.—Mr. E. J. B. Sopp proposed, and Mr. F. C. Thompson seconded, that Messrs. Oscar Whittaker, of Bolton; James Roland Charnley, F.E.S., of Preston; A. G. Wallington, of Warrington; John Lea, and J. Jervis Richardson, of Liverpool, be elected members of the Society. It was unanimously decided to hold the next meeting in Liverpool, on Nov. 10th, and that a meeting be held in Warrington, on Dec. 8th, provided the secretaries were able to make all necessary arrangements for the same. A large and interesting display of insects was shown by members, amongst the more striking being the following:—Fine series of Lepidoptera captured during 1902, by Dr. J. Cotton, on Simonswood Moss and in North Devon, in exhibiting which he gave much valuable information regarding the methods employed in the taking of *Notodonta dictæoides*. Captures at the Delamere field-meeting by Mr. F. N. Pierce included excellent specimens of the local *Tephrosia biundularia* var. *delamerensis*, *Cidaria corylata*, *Thera variata*, and other moths.—Mr. C. F. Johnson exhibited very fine black varieties of *Zygana minos*. Mr. J. R. le

Brockton Tomlin, F.E.S., a valuable collection of British Coleoptera, containing, amongst other scarce species, series of recent captures of the very rare *Hydrovatus clypeatus*, a water-beetle that had not been taken for many years; the rare "skipjacks," *Elatér miniatus*, *E. lythropterus*, and *E. sanguinolentus*; *Antharia nitidula*, *Agrius biguttatus*, and *Cryptocephalus serripunctatus*, from the New Forest; *Phosphænus hemipterus*, from Southampton; and the beautiful longicorn, *Saperda scalaris*, from Sherwood.—Dr. G. W. Chaster, recent captures in the Southport district, which included many unique additions to the Lancashire county list. Of the many species in his exhibit, perhaps the following attracted most attention:—*Medon obsoletus*, *Thinobius brevipennis*, *Pseudopsis sulcata*, *Anisotoma furva*, and *A. ciliaris*. The extremely local *Ammaeus brevis*, *Ægialia rufa*, *Telephorus darwinianus*, *Gymnetron collinus* and *G. linaria*, and *Ceuthorrhynchus euphorbiæ*.—Mr. J. T. Wardley, a case of *Cossus ligniperda*, bred from Formby larvæ; and Mr. Oulton Harrison (Wavertree), on behalf of Rev. T. Eddrup, a box of *Emmetica cervinata*, from Bremhill, Wilts, kindly sent for distribution.—Mr. R. Tait, fine varieties of *Bourmia repandata*, some rosy forms of *Agrotis agathina*, a beautiful series of *A. ripæ* from Cumberland, and bred varieties of *Acidalia contiguaria*, including two unique aberrations.—Mr. J. Roland Charnley, a fine male *Chrysophanus dispar*.—Mr. J. Collins, long bred series of *Eupithecia debiliata*, from Stafford; *Crambus warringtonellus*; *C. hamellus*, from Lancashire Mosses, *Lithosia sericea*, and *Exæretia allisella*.—Mr. H. B. Prince, a remarkably fine series of *Erebia cassiope*, and other species.—Mr. B. Crabtree, a long series of *Canonympha typhon* (*davus*) var. *rothliebi*, arranged to show the extreme range of variation on the under side. Mr. W. Raeper, Scotch captures during the present season, including many interesting moths.—Mr. J. Jervis Richardson, exotic Lepidoptera, including *Intomeris io*, reared this season; also a series of beautifully produced photographs of British lepidopterous larvæ. Mr. E. J. B. Sopp, a collection of palæarctic and exotic Forficulidæ, which included representatives of our giant Christchurch earwig, *Labidura riparia*; *Anisolabis mauritanica*, from Tunis; *Spongiphora Croceipennis lherminieri*, from Santo Espirito (Brazil); *Chelidura bolivari*, from Castile; *Apterygida japonica*, from Japan, and *Forficula pubescens*, a Southern-European earwig recently taken at Colchester by Mr. Harwood.

The usual monthly meeting was held in the Royal Institution, Liverpool, on November 10th, Dr. J. Cotton (St. Helens) in the chair.—Messrs. Oscar Whittaker (Bolton), J. R. Charnley, F.E.S. (Preston), A. G. Wallington (Warrington), John Lea, and J. J. Richardson (Liverpool) were duly elected members of the Society.—The arrangements made for the forthcoming meeting to be held in Warrington having been approved, a highly interesting paper on "Some Famous Collecting Grounds" was communicated by Mr. Oulton Harrison (Wavertree), whose instructive descriptive account of various entomological "centres" in Switzerland and Britain was rendered still more attractive by nearly two hundred lantern views. Many of the typical lepidopterous and other denizens of the Meiringen district, Lucerne, Rosenlani, &c., were enumerated, and descriptions given of favourite haunts of some of our insular insects and birds in the New, Epping,

and Delamere Forests. A hearty vote of thanks having been accorded the lecturer, the following exhibits were described and shown:—British *Donacia*, by Messrs. J. F. Dutton and J. R. le B. Tomlin; *Emmetica cervinata* (Wilts), by Mr. O. Harrison; Lithosidæ, by Mr. F. N. Pierce; hymenopterous captures during 1902, by Mr. F. Birch; *Trigonogenius globulum* from Hoylake, and Ixodidæ from leg of a tortoise, by Mr. W. H. Jennings; *Metecus paradoxus*, and recent coleopterous captures at Liverpool, by Mr. Guy A. Dunlop; some magnificent exotic Lepidoptera, and photographic slides of British lepidopterous larvæ shown upon the screen, by Mr. J. Jervis Richardson; and Coleoptera from the Sibutu and Sulu Islands, by Mr. E. J. Burgess Sopp.—E. J. BURGESS SOPP, *Hon. Sec.*

RECENT LITERATURE.

J. W. TUTT.—*British Lepidoptera*. Vol. iii. 558 pages. London: Swan Sonnenschein & Co., Paternoster Square, E.C.

It is pleasant to be able to review such an eminently satisfactory book as is the third volume of 'British Lepidoptera.' Its predecessors were very welcome, but to a large number of entomologists the mass of material relating to the "Micros" was probably unread, and thus a large portion of vols. i. and ii. appealed only to a limited number. This third volume, therefore, should find more support, as the species treated of are all very well known to the great majority of collectors. The minutiae inevitably involved in such an undertaking are again manifest, and with what effect they have been utilized it is for each individual to judge for himself. It is strongly to be hoped that the necessary increased support will be forthcoming, and that many more numbers are in store for us.

The super-family Lachneides is continued, and the first species treated is *Pachygastria trifolii*, which occupies exactly thirty pages. Following this comes the species that has doubtless caused more research and taken up more time than any hitherto already done, viz., *Lasiocampa quercus*. Preceding the description and all that follows concerning the life-history of the type and its numerous forms and varieties, is a summary of the experimental work in the hybridizing of the different local races. Although nominally we have no chapter to commence vol. iii., this summary of hybridization is a very good substitute, and has as much general interest as any such that has appeared in the previous volumes. By the time the "Times of Appearance," "Habits," "Localities," &c., have all been worked through, eighty pages have been covered over this species alone, and it is doubtful if anything of any moment concerning this insect can have escaped Mr. Tutt's attention.

Passing on to *Macrothylacia rubi* and *Cosmotriche potatoria*, perhaps one of the most interesting collection of facts is to be found in the length and diversified character of the habits of the larvæ of these two species. To the former as much as five and a half pages are alone given to this part of the scheme. *Gastropacha ilicifolia* comes, in its

turn, with full descriptions of larva, cocoon, pupa, food-plants, parasites, and so on; and the collector will doubtless read with avidity the "Habits and Habitat" section.

Under *Dimorpha versicolora* the question of its allies is freely discussed, and the reader is referred back to vol. i., pp. 124-125, and vol. ii., p. 440, for further discussion. One cannot help wishing, however, that the author would point out where (when possible) the imaginal characters are in agreement with the biological ones in assigning, or helping to assign, a position to a sub-family. The larval and pupal habits under this species are again full of interest, and cannot fail to engage the attention of both student and collector.

At p. 265 the super-family Attacides is brought under review. In the Preface the author says he is "entirely dissatisfied with his knowledge of the relationships of the various families of the Saturniides (Attacides) *inter se*, of those of the Sphingides *inter se*, and of these two super-families to each other." It, however, cannot be that he has not probed deep enough, for the thirty pages or so, before our only British Attacid (*Saturnia pavonia*) is treated, require the closest attention of the reader. The very thorough examination and diagnoses of the characters afforded by the larvæ of the Attacides will call for time and thought for full digestion.

From p. 342 to the end of the volume the classification and position of the Sphingides are discussed, and the complete natural history of the British species of Amorphinæ and Hemarinæ recorded. Starting with Linnæus, and working through Fabricius, Scopoli, Lamarek, Latreille, Hübner, Laspeyre, Oken, Leach, Dalman, Ochsenheimer, Swainson, Boisduval, Stephens, Curtis, Duponchel, Duncan, and Westwood, a very complete review is given of the generic synonymy of the British Sphingids, and at the close a list of the types of the genera deduced is set forth. Another long diagnosis is given to the history of the super-family, and, starting with Réaumer, the works of Hübner, Stephens, Grote and Robinson, Butler, Herrick-Schäffer, Meyrick, Poulton, and Dyar, are all brought under the focus in the order given. On pp. 365-366 is a scheme, drawn up by Bacot, for separation into genera, based on larval characters, and close following is a family and sub-family division proposed by Chapman. Concerning the latter, one notes that the Sesiinæ are only separated from the Eumorphinæ by the tufts to the abdomen, a character that certainly does not hold good throughout. Perhaps in vol. iv. some better character will be furnished when the true Macroglossids come to be reviewed. The high specialisations of both larva, pupa, and imago are fully discussed. The details concerning the pupa offer food for reflection, both as regards the proboscis-casing and the varying position of the glazed eye, which latter, if we are not mistaken, is brought forward for the first time. We have descriptions given of all the different hybrids produced in the Amorphinæ, not the least interesting being the comparison between the hybrids produced by *Amorpha populi* and *Smerinthus ocellata*, and hybrids from *Amorpha austauti* and *Smerinthus atlanticus*. A very complete classification of the forms and aberrations of *Mimas tilia* is to hand at p. 404, and the same long lists of localities are given, showing in many cases unsuspected curtailment or otherwise in the range of distribution. On

reference, for instance, to *Hemaris fuciformis*, it is noted as "exceedingly rare, if not entirely absent in Scotland and Ireland." No one, after this, will deny that these extended lists serve a purpose other than that for the collector.

In conclusion, there is only one matter we really regret, and that is that we have had to wait two years for the present instalment. It is pretty certain, however, that the book is all the more complete.

W. J. K.

RECENT ECONOMIC LITERATURE.

(By G. W. KIRKALDY, F.E.S.)

G. DARBOUX and C. HOWARD. "Hilfsbuch für das Sammeln der Zoocecidien mit Berücksichtigung der Nährpflanzen Europas und des Mittelmeergebietes," pp. xii and 68. Berlin, 1902. Gebrüder Borntraeger.

This is a list of the "gall-makers" of Europe and the basin of the Mediterranean, arranged under their respective plants, the latter being catalogued alphabetically under their genera and species. The location of the attack is also indicated by signs. The title-page and preface are in German and French, and there is an alphabetical appendix of 183 genera of gall-makers. The little work is plainly but well "got up," and of convenient compass, and should be indispensable to students of galls and economic entomologists generally.

PROCEEDINGS of the 13th Annual Meeting of the Association of Economic Entomologists (1902, U. S. Dep. Agric. Entom. n.s. Bull. xxxi. pp. 1-103; two plates and four text fig.).

AMONG the numerous interesting papers read at the 1901 meeting were E. P. GILLETTE's account of the Codling Moth (*Carpocapsa pomonella*), and notes on Colorado Insects; E. P. FELT, on the Hessian Fly (*Cecidomyia destructor*), and observations on forest and shade tree insects in New York State; W. M. SCOTT and W. F. FISKE, on "Jarring for the Curculio," with a list of the numerous Rhynchota and Coleoptera collected; C. L. MARLATT's Preliminary Report on the San José Scale; and H. GOSSARD's Review of the Whitefly (*Aleurodes citri*) problem. The discussion on the San José Scale (*Aspidiotus perniciosus*) seems to have been very animated, Marlatt and Howard holding that the pest was introduced from America into Japan, while Cockerell and Kellogg considered that it came to America *via* Japan. The Japanese forms were generally considered to be the true *perniciosus*.

E. E. GREEN. "Mosquitoes and Malaria" (1901, December, Botanic Gardens, Ceylon; Circular, 1st series, no. 25, pp. 345-68).

IN common with all other practical investigators, Green holds that the connection between malarial fever and mosquitoes has passed out of the hypothetical stage; the only debatable point, even about which there is very little difference of opinion, is "whether the mosquito is

the sole medium of infection." The "mosquito"—of which twenty species belonging to nine genera are noted as Sinhalese, though only one species, viz. *Anopheles rossii*, Giles, "has been definitely proved to convey the malarial germs"—is pronounced guilty of an appalling series of crimes; malarial fever, filariasis (including elephantiasis), excessive anæmia, yellow fever, and "after-effects" following repeated attacks of malaria, such as the dangerously enlarged spleen so prevalent amongst natives, derangement of the liver, &c., "Bright's Disease," &c. It is therefore obvious that practical studies in the most minute detail are of the highest national importance, and it is remarkable that British entomological journals should have devoted so little attention to notices of some part at least of the vast amount of work already done.* It is evident from perusal of the daily and weekly newspapers that an enormous amount of misconception and pig-headed ignorance as to the causes of malarial fever, &c., still remains to be combatted.

As these Circulars are primarily for the benefit of residents in Ceylon, not specially entomologists, the present one is necessarily to a certain extent a compilation; at the same time the whole subject is very adequately treated in the brief space at the author's disposal, and it is evident that Mr. Green has thoroughly and practically investigated the details discussed.

Preventive measures are considered at some length.

1. "*Those aimed at the extermination of the mosquito*"; and 2. "*The elimination of the malarial element*."—To destroy the early stages in their breeding-pools, as advocated by L. O. Howard, rags soaked in kerosine are employed for painting the surface of the water, thus forming a thin film, which is rapidly fatal to the inhabitants of the pools. Of course this treatment is not feasible for drinking-water; the tanks or cisterns for this should be constructed with closely fitting covers. Moreover, as the oil is as destructive to plants as to animals, it is inapplicable for ornamental lakes containing water-plants, or for rice-fields. A good system of drainage of useless pools is strongly advocated. For protection against the adults, "mosquito cones," castor-oil plants, &c., are considered entirely useless; the isolation of active "cases" of malarial fever and the proper use of quinine are advocated.

3. "*Protection from the bites of mosquitoes*."—The construction of mosquito-proof bungalows, such as have been experimentally erected in Africa and Italy, and are in use in America, is recommended; but Mr. Green fears that the question of expense and the æsthetic feeling of those who would dislike to reside in a huge meat-safe are likely to prevail at present. The use of properly constructed mosquito-nets and applications of various substances, particularly common soap, are advised, the latter being very effective for curative purposes.

JOHN B. SMITH discusses interesting insecticide experiments at some length in "The Entomologists' Experimental Orchard" (1902, New Jersey Agr. Exp. Sta., Bull. 155, pp. 1-71).

* See, however, 'Entomologist,' 1900, pp. 133, 218, 363, &c.

MALCOLM BURR. "The Earwigs of Ceylon." 1902, Journ. Bombay Nat. Hist. Soc. for 1901, pp. 59-78 and 316-36; two plates (one coloured).

A VALUABLE account of the Sinhalese Forficularia, which are of special interest as embracing the long enigmatic *Dyscritina*, now, through the researches of E. E. Green, known to be the larva of *Diplutys*. After an introduction dealing with the external morphology of the group,* the genera and species are fully discussed systematically. Fifteen genera and thirty-five species (four new) are credited to the fauna; of these seventeen are precinctive, ten confined to the Southern Oriental Region, three extend over this and also over the Malayan Archipelago, one of the latter also over Polynesia; one is found in the Kamemns, and in Ceylon, and four are cosmopolitan. The large proportion—practically 50 per cent.—of precinctive species is doubtless due largely to the indifference of collectors in the Oriental Region. The two plates, by Mr. Schuster, are carefully drawn and effective.

Geographical Distribution.—R. F. SCHARFF publishes a preliminary note on the influence of the Pyrenees on the animal migrations between France and Spain. The details are taken from Vertebrata and Mollusca, with the exception of a reference to the butterfly *Parnassius apollo*, but the conclusions will be interesting to other workers. Dr. Scharff states (*a*) that although the Pyrenees formed an obstacle to the migration of animals between France and Spain, and *vice versa*, nevertheless they would readily be able to go round on the east and west sides; and (*β*) that the older, widely distributed species have travelled mostly over the mountain-ridges. It is also to be accepted as a fact that this migration took place in most cases before the Ice Age ("Über den Einfluss der Pyrenäen auf die Tierwanderungen zwischen Frankreich und Spanien," 1902 Verh. V. Internat. Zool. Congr. Berlin, 1901, pp. 1-5 [sep. ?])

Rhynchota.—MRS. C. H. FERNALD discusses the application of the type of the Linnean genus *Coccus*, and concludes that that distinction should be conferred upon *hesperidum* Linné. *Coccus*, therefore, replaces *Lecanium* Burmeister (= *Calypticus* and *Calymnatus* Costa). The species so long known as *Coccus cacti* will, as shown by Cockerell, now bear the name *Monophlebus cacti*. We are glad to learn that Mrs. Fernald will soon publish a synonymic Catalogue of the Coccidæ. Owing to their economic importance, stability in their nomenclature is more important even than in other groups, and many wide changes have been effected in this respect since the appearance, in January, 1899, of the first supplement to Cockerell's Check-list (1902, "On the type of the genus *Coccus*, L." Canadian Entom., pp. 232-3).

* Mr. Burr believes that many "so-called cases of gynandromorphism are merely males with one branch of the forceps undeveloped, *i. e.* simple, and resembling those of the female. In all the instances that I have seen there have been nine abdominal segments visible, as in the normal male."

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Great deeds are done and great discoveries made.”

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ERRATA.—P. 101, line 15, for "Towlin" read "Tomlin." P. 150, line 27, for "Eviopeltis" read "Eriopeltis"; and line 33, for "Palvinaria" read "Pulvinaria." P. 212, line 2, for "nearly" read "merely." P. 289, line 7, for "under side of the hind wings" read "under side of the right fore wing." P. 290, line 13 from bottom, for "Mr." read "Mrs."

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UNDESCRIBED ORIENTAL RHYNCHOTA.

By W. L. DISTANT.

Fam. REDUVIIDÆ.

EMESINÆ.

Luteva feana, sp. n.

Piceous; anterior lobe and anterior margin of posterior lobe of pronotum, body beneath—excluding apex of abdomen—coxæ, bases and apices of anterior femora and tibiæ, bases of intermediate and posterior femora, luteous; a large spot on corium at base of membrane, and a small apical spot to membrane, cretaceous white. Anterior coxæ considerably passing apex of head; anterior lobe of pronotum glabrous, posterior lobe punctate; basal joint of antennæ luteous at base, about as long as abdomen; anterior femora thickly and finely spinous beneath. Long. 5 millim.

Hab. Burma; Bhamo, Palon (*Fea*).

NABINÆ.

Allæorhynchus marginalis, sp. n.

Head, pronotum, scutellum, and sternum piceous, shining; a lateral spot on each side of scutellum, and the corium, brownish piceous; a spot on apical margin of corium and its apical angle ochraceous; membrane pale piceous, its basal angle narrowly ochraceous; connexivum above and beneath ochraceous, spotted with piceous; abdomen beneath castaneous; legs, rostrum, and antennæ ochraceous, apices of femora and bases of tibiæ brownish ochraceous; second and fourth joints of antennæ about equal in length, third a little longer than first; body above finely pilose; anterior and intermediate femora thickly and finely spinous beneath; anterior tibiæ distinctly clavate at apices. Long. 7 millim.

Hab. Burma; Katha (*Fea*).

Allied to *A. nigra*, Walk.

Phorticus cingalensis, sp. n.

Head, scutellum, sternum, and membrane piceous; pronotum and corium dull castaneous; anterior margin of pronotum, a basal spot to corium, connexivum, posterior margin of prosternum, abdomen, legs, and rostrum luteous; antennæ brownish ochraceous, base and apex of third joint luteous; basal joint of antennæ passing apex of head, first and second joints incrassate; pronotum faintly transversely constricted; membrane slightly passing abdominal apex, its apical margin narrowly fuliginous; body distinctly pilose. Long. $2\frac{2}{3}$ millim.

Hab. Ceylon (*Lewis*).

LIFE-HISTORY OF *VANESSA ANTIOPA*.

By F. W. FROHAWK, M.B.O.U., F.E.S.

(Concluded from vol. xxxv. p. 301.)

AFTER fourth and last moult the larva measures, when fully grown, $2\frac{1}{8}$ in. long, of almost uniform thickness, excepting the first segment, which is much the smallest. The head is bilobed, having a deep notch on the crown, and of a dull black colour, covered with black warts, each emitting a white hair. The segmental divisions are deep, each segment being swollen in the middle, and transversely wrinkled on the posterior half; the spines are long and tapering to a very sharp point, shining black, and bear a number of fine white hairs, each having a black swollen base; the two anterior pairs of dorsal spines are branched, each having two; the first segment is spineless. The arrangement of the spines is as follows: four each on second and third segments—these are the longest spines on the body, and are placed subdorsally and laterally; six each on fourth and fifth, and seven each on all the remaining segments, excepting the last, which has four subdorsal ones, making in all sixty-six spines; from the sixth to eleventh segments (both inclusive) each has a short medio-dorsal spine, which is absent from the rest; the other spines on the fourth to eleventh inclusive form subdorsal, super-spiracular, and sub-spiracular rows. The ground colour is a deep velvety black, the surface is minutely but roughly granulated, being covered with extremely minute points, and densely sprinkled with pearl-white warts, each emitting a fine white hair, some being of considerable length, and the majority slightly curved; they curve in different directions, giving the larva a soft silky or velvety appearance from the varied play of light falling on the hairs; the segmental divisions are bare, as well as the interstices of the wrinkles, which appear of a deep velvety black; down the centre of the back is a series of rich deep rust-red shield-like markings, which commence

on the third segment, and terminate on the eleventh segment, the first being the smallest, and composed of four spots, the two anterior ones are very small, the red runs along each side of the medio-dorsal spine, and behind it in the middle of the red are three black markings; all the red markings have the surface granular like the rest of the body, and scattered with similar hairs, but the base of each is yellowish; in the centre of the anal segment is a shining black dorsal disk, much resembling the head; the spiracles are black and inconspicuous, the legs are black and shining, and the four pairs of middle claspers are a burnt-sienna or rust colour, with a polished band above the feet, which are amply furnished with hooks; the anal pair are black, with pale reddish feet.

The larvæ are gregarious until full-fed; they then become very restless, and crawl rapidly about in search of a suitable place for pupation. The first became full-fed on June 20th, when several started crawling restlessly about. After crawling for five hours, I then enclosed seven of them in a glass-covered box to watch results; after crawling about for another hour, they finally rested close together on the top of the box (inside), and I noticed from time to time they were spinning pads of silk, as well as a layer of silk to rest upon, and, attaching the anal claspers to the pads, they settled down for pupation. Next day one after the other became suspended, and the following day (June 22nd) they all (the seven) pupated.

Like other *Vanessidæ* larvæ, *antiopa* are very sensitive to any disturbance; any sudden noise sufficient to cause concussion of the air causes the whole brood to give a violent jerk. From this instantaneous movement of several hundred larvæ in a dense mass, the effect is very curious, and, I should think, somewhat alarming to any insectivorous bird that might approach them too closely. This habit exists through all its stages. Whether this is a protective habit or not cannot be said, but the spines in the last two stages, especially after the fourth moult, are so sharply pointed, that I have frequently had them pierce my hands. Therefore, if occasion offered, such efficient weapons of defence would afford considerable protection to the larvæ.

Both sallow and willow are equally suitable food for the larvæ, and birch is readily eaten, even when willow has formed the sole food until the last stage; they will also feed on elm. Nettle, I found, was not appreciated, and not touched by them during the last two or three stages; only when first hatched could I induce them to feed upon it, and, although they lived upon nettle for several days, they did not thrive, and eventually died.

The pupa measures in total length, including the cremaster, from 1 in. to $1\frac{1}{4}$ in. The average of the male pupa is 1 in., and that of the female $1\frac{1}{8}$, but large females are as much as $1\frac{1}{4}$. Side view: The head is beaked in front, the thorax angular,

rising to a pointed dorsal keel, and sloping posteriorly to the sunken metathorax; the abdominal segments rise to the third, then decreasing and curving to the anal segment, which terminates in a long slightly curved cremaster, furnished with an ample cluster of hooks; the ventral surface forms a fairly straight line, except bulging at the apex of the wings. Dorsal view: The head terminates in two well-developed points; there are three points which project laterally on the wing, the first on the base, the second on the inner margin, and the third near the anal angle; between these points the outline is concaved, the abdomen gradually tapers to the anal segment, the cremaster is broad, flattened, rounded at the end, and has a sunken centre. On the fourth, fifth, sixth, seventh, and eighth abdominal segments are a medio-dorsal black point and a subdorsal series of six prominent points, commencing on the second segment, and ending on the seventh segment; those on the eighth and ninth segments are very small, that on the fourth segment is the largest; they have pale bases, black centres, and orange tips; there are also two rows of small black tubercles, the first super-spiracular, the second sub-spiracular; each row is composed of a single tubercle on each segment; the spiracles are narrow transverse apertures of a dusky colour. The dorsal half of the head and wing points are black, and the ventral half orange. The whole surface is finely and irregularly furrowed and granulated. The ground colour is a pale buff, covered with fine fuscous reticulations. The entire surface is clothed with a whitish powdery substance, giving a pale lilac or pinkish bloom to the pupa, which, however, is easily rubbed off, the pupa then assuming a brownish hue. I found no variation in the colouring of the pupæ; every one of the number—between fifteen hundred and two thousand—was precisely as described.

Immediately the pupa rids itself of the larval skin it is so vigorous in its efforts to anchor the cremastral hooks firmly into the silken pad by its twistings and twirlings, that I have seen them actually tear themselves away and fall to the ground.

From this host of pupæ butterflies commenced emerging during the middle of July, and continued until the middle of August, during which time something over fifteen hundred had emerged. From this large number I selected a good series, showing considerable variation in the colouring of the borders and blue spots, but I did not succeed in obtaining any striking aberration; but the majority of the specimens were very fine, and many exceptionally large, a quantity being of greater size than any in my series of British-caught examples, or any European ones I have seen. The largest of these beautiful insects is a huge female measuring exactly $3\frac{1}{2}$ in. in expanse.

The colour of the marginal band varies from a pale straw-

yellow to a rich deep ochreous or tawny yellow; in some specimens the band is almost plain, being only very faintly and sparsely sprinkled with dusky specks, while others have the bands thickly speckled and almost blotched with black, similar to the North American form. The submarginal series of blue spots vary much in size, and are of two distinct hues; the usual colour is a light, bright, and somewhat metallic blue, and in some examples the spots are a clear metallic lilac. The ground colour is liable to vary from deep purplish black to rich chocolate or deep ruby brown; in some the central portion of the primaries is considerably darker than the rest of the ground colour, forming an indistinct pattern.

I should here mention that the above description of the larvæ is contrary to that given by Buckler, who states that the young larvæ are much more pubescent than when adult, and that the naked spots on the back are green; and of the full-grown larva: "The ventral prolegs are wholly reddish green, . . . the anal pair black, with reddish-green feet." This description must have been from an extraordinary variety of the larva, but I find it copied in the most recent works on the British Butterflies.

ON THE BUTTERFLIES COLLECTED IN EQUATORIAL AFRICA BY CAPTAIN CLEMENT SYKES.

By EMILY MARY SHARPE.

(Continued from vol. xxxv. p. 311.)

Family LEMONIIDÆ.

LIBYTHÆINÆ.

99. *LIBYTHEA LABDACA*, *Westw.* — *a, b*. March from Usoga to Nandi; April, 1900.

100. *ABISARA DELICATA*, *Lathy*, *Trans. Ent. Soc. Lond.* 1901, p. 28, pl. iii. fig. 4. — *a*. March from Usoga to Nandi; April, 1900.

Family LYCÆNIDÆ.

101. *LACHNOCNEMA BIBULUS* (*Fabr.*). — *a, b*, ♂ ♀. Wadelai; January–March, 1900.

102. *OBORONIA PUNCTATUS* (*Dewitz*). — *a*. March from Usoga to Nandi; April, 1900.

103. *AXIOCERSES HARPA*X (*Fabr.*). — *a*, ♂. Wadelai; January–March, 1900. *b, c*, ♂ ♀. March from Usoga to Nandi; April, 1900.

104. *CHRYSOPHANUS ABBOTTII*, *Holland.* — *a*. March from Usoga to Nandi; April, 1900.

105. *CASTALIUS CALICE* (*Hopff.*). — *a*. Lamogi; November, 1899.

106. *URANOTHAUMA FALKENSTEINII* (*Dewitz*).—*a, b*. March from Usoga to Nandi ; April, 1900.
107. *PHLYARIA CYARA* (*Hewits*).—*a, b*. March from Usoga to Nandi ; April, 1900.
108. *TARUCUS PLINIUS* (*Fabr.*).—*a*. Wadelai ; January–March, 1900. *b*. March from Usoga to Nandi ; April, 1900.
109. *POLYOMMATUS BÆTICUS* (*Linn.*).—*a, ♂*. Wadelai ; January–March, 1900).
110. *CATOCHRYSOPS PATRICIA* (*Trim.*).—*a, ♀*. March from Usoga to Nandi ; April, 1900.
111. *C. CISSUS* (*Godt.*).—*a, ♀*. March from Usoga to Nandi ; April, 1900.
112. *C. ASOPUS* (*Hopff.*).—*a, ♂*. March from Usoga to Nandi ; April, 1900.
113. *LYCÆNESTHES LARYDAS* (*Cram.*).—*a, b, ♂*. March from Usoga to Nandi ; April, 1900.
114. *ZIZERA GAIKA* (*Trim.*).—*a, ♂*. March from Usoga to Nandi ; April, 1900.
115. *HYPOLYCÆNA ANTIFAUNUS* (*Doubl. & Hewits.*).—*a, ♀*. March from Usoga to Nandi ; April, 1900.
116. *H. PACHALICA*, *Butl.*.—*a, b, ♂*. Wadelai ; January–March, 1900.
117. *H. PHILIPPUS* (*Fabr.*).—*a, ♀*. March from Usoga to Nandi ; April, 1900.
118. *VIRACHOLA ANTALUS* (*Hopff.*).—*a, ♂*. March from Usoga to Nandi ; April, 1900.
119. *TINGRA AMENAIIDA* (*Hewits.*).—*a*. Wadelai ; January–March, 1900.
120. *TANUETHEIRA PROMETHEUS*, *H. H. Druce.*.—*a, ♂*. Unyoro ; March, 1900.

Family PIERIDÆ.

121. *NYCHITONA IMMACULATA* (*Auriv.*).—*a, b*. March from Usoga to Nandi ; April, 1900.
122. *TERIAS BRIGITTA* (*Cram.*).—*a*. Wadelai ; January–March, 1900. *b*. March from Usoga to Nandi ; April, 1900.
123. *T. MARSHALLI*, *Butl.*.—*a–c*. March from Usoga to Nandi ; April, 1900.
124. *T. BOISDUVALIANA*, *Mab.*.—*a*. Lamogi ; November, 1899. *b–d*. Wadelai ; January–March, 1900. *e*. Unyoro ; March, 1900.
125. *PINACOPTERYX VIDUA*, *Butl.*, *P. Z. S.* 1899, p. 972, pl. lxx. fig. 8, 9. *a–c, ♂ ♀*. March from Usoga to Nandi ; April, 1900.
126. *P. PIGEIA* (*Boisd.*).—*a, ♀*. March from Usoga to Nandi ; April, 1900.

127. *GLUTOPHRISSA SABA* (*Fabr.*).—*a*, ♀. Wadelai; January–March, 1900. *b*, *c*, ♂. March from Usoga to Nandi; April, 1900.

128. *BELENOIS MESENTINA* (*Cram.*).—*a*, *b*, ♂. Wadelai; January–March, 1900.

129. *B. INFIDA*, *Butl.*.—*a*, ♀. Wadelai; January–March, 1900. *b*–*d*, ♂ ♀. March from Usoga to Nandi; April, 1900.

130. *B. CRAWHAYI*, *Butl.*.—*a*, *b*, ♂. March from Usoga to Nandi; April, 1900.

131. *B. WESTWOODI*, *Wallgr.*.—*a*, *b*, ♂ ♀. March from Usoga to Nandi; April, 1900.

132. *B. INSTABILIS*, *Butl.*.—*a*–*c*, ♂ ♀. Wadelai; January–March, 1900.

133. *B. ? CALYPSO* (*Drury*).—*a*, ♂. Unyoro; March, 1900. *b*, ♂. March from Usoga to Nandi; April, 1900.

These two specimens differ from the typical form in having no black spot at the end of the discoidal cell on the primaries of the upper side.

134. *B. SOLILUCIS*, *Butl.*.—*a*–*d*, ♂ ♀. March from Usoga to Nandi; April, 1900.

135. *PHISSURA SYLVIA* (*Fabr.*).—*a*, *b*, ♂. March from Usoga to Nandi; April, 1900.

136. *MYLOTIRIS POPPEA* (*Godt. nec Cram.*).—*a*, ♂. March from Usoga to Nandi; April, 1900.

137. *M. AGATHINA* (*Cram.*).—*a*, *b*, ♂. March from Usoga to Nandi; April, 1900.

138. *M. RUBRICOSTA* (*Mab.*).—*a*. Unyoro; March, 1900.

139. *M. CHLORIS* (*Fabr.*).—*a*, ♀. March from Usoga to Nandi; April, 1900.

140. *M. CLARISSA*, *Butl.*.—*a*, ♀. March from Usoga to Nandi; April, 1900.

141. *M. WINTONIANA*, *E. M. Sharpe.*.—*a*, *b*, ♂ ♀. March from Usoga to Nandi; April, 1900.

142. *M. JACKSONI*, *E. M. Sharpe.*.—*a*, ♀. March from Usoga to Nandi; April, 1900.

143. *LEUCERONIA PHARIS* (*Boisd.*).—*a*, ♀. March from Usoga to Nandi; April, 1900.

144. *L. BUQUETTI* (*Boisd.*).—*a*, ♂. March from Usoga to Nandi; April, 1900.

145. *L. THALASSINA* (*Boisd.*).—*a*, ♂. March from Usoga to Nandi; April, 1900.

146. *L. ARGIA* (*Fabr.*).—*a*–*c*, ♂ ♀. March from Usoga to Nandi; April, 1900.

147. *ERONIA LEDA* (Boisd.).—*a*, ♀. Wadelai; January–March, 1900. *b–d*, ♂ ♀. March from Usoga to Nandi; April, 1900.

148. *COLIAS ELECTRA* (Linn.).—*a–c*, ♂ ♀. March from Usoga to Nandi; April, 1900.

149. *CATOPSILIA FLORELLA* (Fabr.).—*a*, ♂. Lamogi; November, 1899. *b*, ♂. Wadelai; January–March, 1900. *c, d*, ♀. March from Usoga to Nandi; April, 1900.

150. *TERACOLUS ERIS* (Klug), E. M. Sharpe, Monogr. *Teracolus*, p. 24 (1898).—*a, b*, ♂ ♀. March from Usoga to Nandi; April, 1900.

151. *T. CALAIS* (Fabr.), E. M. Sharpe, *t. c.*, p. 1 (1898).—*a, b*, ♂ ♀. March from Usoga to Nandi; April, 1900.

152. *T. PHLEGYAS* (Butl.), E. M. Sharpe, *t. c.*, p. 61 (1900).—*a, b*, ♂ ♀. Wadelai; January–March, 1900. *c*, ♂. March from Usoga to Nandi; April, 1900.

153. *T. PUNICEUS* (Butl.), E. M. Sharpe, *t. c.*, p. 38 (1899).—*a*, ♂. March from Usoga to Nandi; April, 1900.

154. *T. PROTOMEDIA* (Klug).—*a–c*, ♂ ♀. Wadelai; January–March, 1900.

155. *T. ANTIVEPPE* (Boisd.).—*a, b*, ♂ ♀. March from Usoga to Nandi; April, 1900.

156. *T. CARTERI*, Butl.—*a–c*, ♂ ♀. Wadelai; January–March, 1900. *d*, ♀. March from Usoga to Nandi; April, 1900.

157. *T. XANTHUS*, Swinh., E. M. Sharpe, *t. c.*, p. 153 (1902).

158. *T. COMPTUS*, Butl., E. M. Sharpe, *t. c.*, p. 153 (1902).—*a*, ♂. Wadelai; January–March, 1900.

159. *T. PSEUDACASTR*, Butl.—*a–e*, ♂ ♀. Wadelai; January–March, 1900. *f, g*, ♂ ♀. March from Usoga to Nandi; April, 1900.

160. *T. THEOGONE* (Boisd.).—*a*, ♂. Wadelai; January–March, 1900. *b*, ♂. Unyoro; March, 1900.

161. *T. DISSOCIATUS*, Butl., E. M. Sharpe, *t. c.*, p. 88 (1900).—*a, b*, ♂ ♀. Wadelai; January–March, 1900. *c, d*, ♂ ♀. March from Usoga to Nandi; April, 1900.

162. *T. AURIGINEUS*, Butl.—*a*, ♀. March from Usoga to Nandi; April, 1900.

163. *T. HELVOLUS*, Butl.—*a*, ♂. March from Usoga to Nandi; April, 1900.

164. *HERPÆNIA ERIPHIA* (Godt.).—*a*, ♂. Unyoro; March, 1900. *b, c*, ♂ ♀. March from Usoga to Nandi; April, 1900.

(To be continued.)

ON SOME NEW GENERA AND SPECIES OF HYMENOPTERA (ICHNEUMONIDÆ, CHRYSIDIDÆ, FOSSORES, AND APIDÆ).

By P. CAMERON.

(Concluded from vol. xxxv. p. 315.)

ANTHOPHILA.

CÆLIOXYS CURVISPINA, sp. nov.

Black; the wings violaceous from the transverse basal nervure; the front, face, and clypeus densely covered with reddish-fulvous pubescence; the scutellar teeth stout, roundly curved on the outer, straight on the inner side, not reaching to the apex of the scutellum. ♀. Long. 13 mm.

Hab. Borneo.

Face coarsely rugosely punctured, the clypeus more closely and not so strongly rugose; the front is distinctly and sharply keeled. The hair on the cheeks is thicker and more rufous in tint than it is on the face or clypeus; on the front it is long and pale, on the clypeus short and white, on the apex of the clypeus it is long, stiff and bright red. Mandibles aciculated at the base; the rest opaque, aciculated, and marked with elongated punctures. Mesonotum rugosely punctured, more closely in the middle at the apex; the scutellum is coarsely rugosely punctured; the lateral teeth are clearly separated beyond their base; the apex of the scutellum is broadly rounded; the post-scutellum is smooth and shining in the middle; the sides irregularly, longitudinally striated. Median segment closely punctured, except in the middle at the apex, and thickly covered on the top and sides with long white hairs; the area is aciculated and deeply furrowed in the middle; the furrow is wider and deeper below. Mesopleuræ coarsely rugosely punctured. Legs black, covered with a pale down; the metatarsus thickly covered with fulvous pubescence. The apical part of the wings has brilliant purple tints; the second transverse cubital nervure has the lower two-thirds broadly rounded. The basal five abdominal segments are closely punctured; the basal two not quite so closely as the apical; the basal half of the last segment is coarsely aciculated, and bears also some scattered punctures; the apical is more coarsely aciculated, is opaque, has a stouter keel in the middle, bordered by a firmer one on either side; these become united at the apex; the lower segment is curved, lanceolate, and projects beyond the upper. The segments, above and below, are fringed with soft, white hair.

Comes nearest to *C. fulvifrons*, Sm., from Celebes, the male of which only is known.

The genus *Epeolus* in India.—The genus *Epeolus* is not included in the 'Hymenoptera of British India' by Col. Bingham. When, therefore, I came across a species of the genus from the Bombay district, I naturally concluded that I had got an addition to the Indian fauna. On looking up, however, the literature of the subject, I find that the species—*Epeolus fervidus*, Smith, Descr. of New Species of Hymen. 102—had been already recorded from India—also from the Bombay district—by F. Smith, whose description must have been overlooked by Col. Bingham.

NEW SPECIES OF INDIAN CHRYSIDIDÆ.

BY MAJOR C. G. NURSE, Indian Staff Corps.

(Continued from vol. xxxv. p. 308.)

The next seven species are quadridentate, and as the identification of the Indian quadridentate Chrysididæ is by no means easy, I have made out the following key, which should be of assistance in separating them. It will be observed that at least two species, viz. *C. gujaratica* and *C. lucinda*, have the sexes dissimilar, the female only having golden or coppery effulgence. I have taken both sexes of these species under circumstances which leave no doubt as to their affinity:—

A. Teeth of 3rd abdominal segment more or less acute.

a. Abdomen with golden or coppery effulgence.

a¹. 1st, 2nd, and 3rd segments with golden or coppery effulgence.a². Stoutly built; length 7–10 mm.a³. Thorax bright metallic green *gujaratica* ♀.b³. Thorax steel-blue *cupreiventris*.b². More slenderly built; under 7·5 mm.a³. 1st segment of tarsi very light testaceous *zobeida*.b³. 1st segment of tarsi dark reddish black *quettaensis*.b¹. 1st and 2nd segments with golden or coppery effulgence *lucinda* ♀.c¹. 2nd and 3rd segments with golden or coppery effulgence *autocrata*.d¹. Two spots on apical segment with golden effulgence *speculata*.

b. Abdomen entirely blue or green.

a¹. Wings more or less fuscous.a². Head smaller than pronotum *fuscipennis*.b². Head as large as pronotum *cotesi*.b¹. Wings entirely hyaline.a². Green or bluish-green.a³. Stoutly built; length 7–9 mm.a⁴. Tegulæ green *lucinda* ♂.b⁴. Tegulæ blue *gujaratica* ♂.b³. Slenderly built; under 7 mm.a⁴. With subapical foveæ *balucha*.b⁴. Without subapical foveæ *obliterata*.b². Blue or greenish blue.a³. Head, thorax, and abdomen of equal width.a⁴. Lateral teeth of 3rd abdominal segment much shorter than median *bahadur*.b⁴. Lateral teeth not much shorter than median *thalia*.b³. Head, thorax, and abdomen not of equal width *seraxensis*.*hoggei*.

B. Teeth of 3rd abdominal segment distinctly blunt...

CHRYSIS GUJARATICA, n. sp.

♀. Robustly built; head, except clypeus and front, thorax, and abdomen closely, but not very finely punctured, the puncturing of the mesonotum, scutellum, postscutellum, and base of the 1st abdominal segment being somewhat coarser, and less close than on the other portions; head at least as wide as pronotum, and about equal to it in size when viewed from above; clypeus sparsely punctured, rounded and very slightly emarginate anteriorly; 2nd joint of flagellum of antennæ nearly as long as the 3rd and 4th united; a ridge in front of the anterior ocellus, and the front below this ridge forming a sharp angle with the vertex, the front being thickly covered with long snow-white pubescence, which hides the sculpturing; pronotum with the sides parallel, and a median longitudinal depression, which scarcely reaches the apex; mesonotum with two short sublateral longitudinal lines, parallel with the sides of the median quadrate division; first two segments of the abdomen of the same width as the thorax, 3rd segment somewhat narrower, the whole abdomen being nearly as long as the head and thorax united; 3rd abdominal segment rounded, with four sharp teeth, the inner ones the longest; an ill-defined median carina on 2nd and 3rd segments above. Light metallic green, the abdomen, especially on the 2nd and 3rd segments, with a coppery tint; mandibles metallic green at base, light red in the centre, black at apex; antennæ dark red; tarsi testaceous; head, thorax, and abdomen covered with short, sparse, white pubescence; wings hyaline, tegulæ dark shining blue, radial cell of fore wing not quite closed at apex.

♂. Similar, but of a darker green, and without the coppery effulgence; 2nd and 3rd joints of flagellum subequal. Long. 7-9 mm.

Hab. Deesa. I found a large colony of this species about a bank in which two species of *Anthidium* (*A. saltator*, Nurse) and a species which I identify somewhat doubtfully as *A. pulchellum*, Klug, were breeding. I presume that the *Chrysis* is parasitic on one or both of these species. It may be worth noting that I had collected for three years at Deesa before I came across this species, and then found it in large numbers within a mile of my house.

CHRYSIS BAHADUR, n. sp.

♀. Head, thorax, and abdomen closely, but not very finely punctured, and with very sparse greyish pubescence; clypeus sparsely punctured, its apex transverse; an irregularly quadrate enclosure below the anterior ocellus, the front below it being very concave; head wider than pronotum, and, when viewed from above, about half as large again as it; abdomen nearly as long as head and thorax united; a median longitudinal depression on the pronotum, and another on the 1st abdominal segment; 2nd and 3rd abdominal segments with a median longitudinal carina, 3rd segment quadridentate, with subapical foveæ, the teeth sharp, and resembling those of *Stilbum splendidum*. Dark blue-green or green-blue; clypeus and front lighter green; 3rd abdominal segment with a purple tinge; basal two joints of flagellum of antennæ with stiff, white pubescence, remainder

of flagellum dark red; tarsi black; wings hyaline, or subhyaline, radial cell closed.

♂. Similar, but of a deeper blue, almost mauve, colour; flagellum of antennæ black. Long. 7-8 mm.

Hab. Kashmir; three specimens obtained at various elevations between 5000 and 9000 ft.

CHRYISIS LUCINDA, n. sp.

♀. Stoutly built, cylindrical; head, thorax, and abdomen closely and regularly, but not very finely punctured; front concave, with stiff white pubescence, which hides the sculpturing; pronotum nearly as large as head, with a median indentation at base; 2nd abdominal segment with a trace of a carina, 3rd segment quadridentate, the teeth acute, with a subapical row of foveæ. Head, thorax, and legs, except the tarsi, metallic green, the central quadrate division of the mesonotum and the joints of the segments inclining to dark blue; 1st and 2nd abdominal segments coppery golden, 3rd segment dark blue, its apex sometimes dark green; antennæ dark rufous; tarsi testaceous; pubescence on head, thorax, abdomen, and legs short and greyish; wings hyaline, fore wing with a very slight fuscous tinge, nervures dark testaceous, tegulæ greenish blue, finely punctured.

♂. Similar; the antennæ lighter rufous; the 1st and 2nd abdominal segments bright metallic green, without any coppery effulgence. Long. 7-8.5 mm.

Hab. Quetta; several specimens.

(To be continued.)

ON A NEW SUBSPECIES OF *ISODEMA ADELMA*, FELD.

By PERCY I. LATHY, F.E.S.

ON comparing some Lepidoptera from Thibet with Chinese forms in Mr. Adams's collection, I noticed among the series of *Isodema adelma*, Feld., an example with an extremely narrow band. I find that this specimen, which came from the Honrath collection, is Felder's type, and bears the locality "Shanghai." This example agrees well with the figure in 'Reise Novaræ,' and I think the Central and Western Chinese and Thibetan forms differ sufficiently to receive a varietal name.

I give below the chief points of difference between this race and the type:—

ISODEMA ADELMA VAR. *LATIFASCIATA*, VAR. NOV.

Differs in the much larger cream-coloured patch within cell, the patches between upper median nervule and submedian nervure twice the size of those in typical *adelma*; the submarginal lunules of both wings below not nearly so well developed.

Hab. Central China, Western China, and Thibet.

SOME ACCOUNT OF THE LARVÆ OF *PÆCILOCAMPA POPULI*.

BY JAMES DOUGLAS.

POSSIBLY a few notes on the rearing and changes of the larvæ of *Pæcilocampa populi* may be of interest to your readers, especially as most of the text-books give very imperfect descriptions of these larvæ. I obtained several batches of eggs in December, 1901; the females, unlike those of *Diloba cæruleocephala* or *Trichiura cratægi*, being attracted by light. The eggs were kept in a room facing east, with an occasional fire. This proved rather too warm a temperature, for the larvæ (then 4 mm. long) emerged from March 22nd to April 3rd, to the number of about one hundred. In consequence of this early hatching, and the lateness of the season, I was almost in despair of rearing them, none of their usual food-plants showing even buds; however, I managed to find a Siberian crab with expanded bracts, and on these the larvæ flourished until the apple-trees were sufficiently advanced. The larvæ were then of a dark bluish tint, with short dark hairs, the subdorsal lines orange, and the head much narrower than the first segment. They grew to the length of 10 mm. by April 9th, when they began their first moult. Immediately after this the ground colour, including the head, was light ochre thickly sprinkled with dark purplish-blue dots, black spots in pairs on each segment; subdorsal lines orange, with white spots between the sixth and seventh segments. A few hours later the ground colour became a light bluish grey, and the head black. There were no signs of any red blotches or tubercles. This moulting continued until April 27th, *i. e.* the last larva did not change until six days after the first had completed a second moult, which began on April 21st, and continued until May 15th. In the early days of this stadium the colour was similar to that of the previous one, except that the black spots were not so conspicuous; size 14 mm. Six days after the moult red blotches described in the fifth stadium began to show signs of appearing, the colour being at first dirty yellow; curiously enough, six of the larvæ showed no signs of this change, the blotches remaining black; but I was unable to detect any difference in them after the next moult.

Third moult, May 6th to June 3rd. General colour lighter, and the whole appearance more variegated; marks on the second segment redder; the larvæ, when at rest, having a curiously flattened appearance. Size, May 6th, 25-26 mm.; May 11th, 32-33 mm.

Fourth moult, May 15th to June 15th. Ground colour creamy white, thickly speckled with black; dull red blotch (not tubercle) on second segment on either side of dorsal line; third

segment with four, fourth to eleventh segments with five, transverse folds; the posterior three of each more swollen; black dots (larger on fourth fold of each segment) on subdorsal line, with slight surrounding tawny tinge. Size, 51–60 mm.

Change for spinning, June 1st to July 2nd. Ground colour general greyish-blue tinge, shading to green at the head, with tawny suffusion below subdorsal, and two double orange spots on each segment; dorsal line blue, subdorsal orange. This period lasted from four to seven or more days, after which the larvæ spun a very opaque cocoon, varying in colour from a dirty yellow to a very dark brown, according to the character of its surroundings.

It will be noticed that the length of each stadium varied considerably in different individuals, so that some larvæ pupated in at most seventy-five days, whilst others took at least ninety, although they all received exactly the same treatment.

The imagines, the first of which appeared on Nov. 1st, seem, so far as they have yet emerged, to be of a ruddier tinge than the majority of those captured. I have secured a number of fertile ova from several parents, and shall be interested in seeing whether this trait will be accentuated in their progeny if fed on apple, and whether it will disappear if some other food-plant is adopted.

Sherborne, Dorset.

DICYCLA OO IN HUNTINGDONSHIRE, 1902.

By G. LISSANT COX.

DURING the "Long" this summer I was very successful in getting round our Dean for several "week-end" exeats, and in company with my friend Mr. H. S. Dickson made some delightful flying visits to many places near Cambridge.

I have been interested to see several notes on *Dicycla oo* in the 'Entomologist' for October and November, and perhaps our experiences with this insect in Huntingdonshire may be of some interest.

On the evening of the 13th of July, when we were bicycling to our headquarters for the night, for some unaccountable whim I dismounted and sugared a noble oak—an old friend—and then went on to our destination. We came past the tree at 2 a.m. on our way home, and I boxed an unknown insect, which, except for the inevitable *Xylophasia monoglypha* (*polydon*), was the sole specimen at the treacle. That we should have taken it at such an hour was, as future events proved, an extraordinary piece of good fortune. We showed our captures to Mr. W. Farren, and he was not long in spotting the single *D. oo*, a male in perfect

condition, in the midst of a case full of lesser gems. We found that he had seen one about a week previously.

On next Saturday, July 19th, the oaks around "our old friend" (now duly canonised and worshipped!) were all sugared by 7.15 p.m. The day had been warm and sunny. In the evening thick clouds came up which effectually obscured our enemy—the moon. A warm drizzle started at 10.30, and hard rain about an hour later which continued during the night.

The first *D. oo* was boxed by my friend as early as 7.30! One or two came before 8. Then the fun waxed fast and furious. No leisurely walking *now* from tree to tree, but hard sprinting. For some time a lamp was quite unnecessary, as they were so conspicuous; and when at last we lit up, they were much more easily frightened off the trees. Soon after nine they became scarcer, and between 10.30 and 11.30 we only took one specimen. On adding up we found we had forty-five between us, of which thirty-six were females, and only nine males.

Sunday, the 20th, was cold, stormy, and wet. The night was cloudy and inclined to rain, with a north wind. The temperature in many parts of England nearly—if not quite—broke all records for July. Not a promising night for sugar. Yet we took sixteen more *D. oo*: hardly another species was seen. This time the sexes were exactly equal. On one tree I remember there were three. When boxing the lowest, the other two flew away, only to return to their identical positions. The lower one was now boxed, when the other one again made off, and again we found it settled down on the same spot from which it had been frightened twice. A most obliging insect is *D. oo*—sometimes! Nothing was to be seen after 10.30, and, more or less frozen in our thin clothes, we made off for bed.

One in every five was of the variety *renago*, figured in Barrett—a lovely insect. Only forty per cent. of our captures possessed immaculate fringes, but none were actually torn. An unsuccessful attempt was made to obtain ova. Early on Monday we returned to Cambridge.

On the 17th a female was taken by Mr. R. Brooke and the Rev. F. Fisher about a quarter of a mile away; and I know of three men who went to our locality on the 23rd and captured a good many. They seemed to brave all kinds of weather, for in the strong north-west gale on the 26th a great number came to sugar.

Almost a month later, *viz.* August 17th, in company with Mr. R. Brooke and his two brothers, a female *D. oo* in good condition, very much to our surprise, turned up at sugar. We were working close to the old locality, and it was nice to have its very near relations—*Calymnia trapezina*, *C. affinis*, *C. diffinis*, and *C. pyralina*—all at sugar on that night. Next evening we resugared the old trees. Only two, however, which had seen much better days, turned up.

Thus the insect was out for some six weeks, but how long in any numbers it is difficult to say. What appeared to be its headquarters was only, as far as I know, worked between July 19th and 26th, except for our trial in August. The only really warm spell in our district this summer was between July 6th and 17th, and doubtless nearly all would emerge then. It would, however, be rash to assign less than three weeks for the period during which they were abundant,—this year at all events. It seems that this season, which has been so abnormal in its amount of sunshine (it always appeared to be raining, too, though the total rainfall was below the average), has not exerted as baneful an influence as might have been expected. The dates of emergence have, of course, been very erratic. Perhaps it will be the coming season that will suffer.

Ellacot, Oxtou, Birkenhead : November 16th, 1902.

NOTES AND OBSERVATIONS.

A PROPOSED ENTOMOLOGICAL EXCHANGE CLUB FOR THE BRITISH ISLES.—At the meeting of the City of London Entomological Society, held November 4th last, Mr. F. J. Hanbury, in accordance with a previous intimation, led a discussion as to the advisability of starting an Entomological Exchange Club for the British Isles on similar lines to the Botanical Exchange Club, which was, and had been, in a very satisfactory position for the past five and twenty years. For the general benefit of those who are disposed to consider whether they would support such a scheme, the following *résumé* of the proposed rules and regulations is here set forth :—

1. The object of the Club is to facilitate the exchange of specimens, especially of critical species and varieties. The conditions of membership are that each member shall furnish a parcel of specimens annually, in accordance with the subsequent rules, and pay an annual contribution of five shillings, or of such other sum as may be found necessary to meet the expenses of the Club. He will then be entitled to share in the distribution of specimens made in the early part of the year following that in which his subscription and parcel were sent.

2. Specimens sent for distribution must be carefully set; must be in perfect condition (unless the species is particularly scarce and in great demand). Badly set or imperfect specimens will be returned as received to their owners. Species that might be in danger of extermination will not be received, except in very small numbers, unless bred *ab ovo*.

3. Each specimen must have a clearly written or printed label bearing the name of the species as given in South's list, and must bear locality and date of capture, or date of breeding, and any date obtained that the sender thinks worth while. Specimens sent in each parcel might be arranged in the exact sequence of names adopted in the catalogue before mentioned. Not less than six specimens of each species should be sent, unless very rare or difficult to procure.

4. Any facts connected with a species which the sender thinks important and suitable for a "Report" should be communicated on a separate sheet of paper, *written on one side only* the notes on each species should be dated and signed by the writer. A Report will be issued at the close of each year containing the various notes sent in by contributors.

5. Each parcel should be accompanied by a list of insects the member wishes to receive from the Club. This list is to be made by drawing a short horizontal line before their names in the catalogue. Species especially wished for should have a ! before the horizontal line. The name of the member and address to which the return parcel is to be sent should be written on the outside of the catalogue, together with any special directions as to the route by which it should be forwarded; the yearly change of distributors necessitates clearness in this particular. When the same copy of the catalogue is used more than once, the species which are no longer wanted, but which were marked, should have a perpendicular line drawn through the horizontal line. Manuscript lists will not be received.

6. Parcels should be sent by parcels post, or by any other means, carriage paid, to one of the distributors for the year *not later than the 31st December*. Those arriving after that date will not be available for the ensuing distribution. Members who send the more valuable parcels will have their return parcels selected before those who send inferior ones.—W. J. KAYE (Sec. City Lond. Ent. Soc.).

INSECT PERIODICITY; MAXIMUM AND MINIMUM PERIODS. —With reference to the discussion concerning *Plusia moneta* which has been going on in these pages (Lawrance, vol. xxxv. p. 242; Colthrup, *ibid.* p. 320), I should like to point out that it is dangerous to generalize too widely from imperfect data. In some cases no doubt the sudden appearance of a species in large numbers (*V. antiopa*), or the addition of a new species to our fauna (*P. moneta*) may be due to immigration or importation. But it does not follow that all increases towards the maximum are to be explained in a similar way. Allowance must be made for secular causes, such as climatic influence upon the special enemies of the species, and so forth. It is difficult, and in most cases practically impossible, to surmise what local fluctuation in external conditions has been operative in determining the maximum or minimum appearance of a species, but it does not seem to me necessary to invoke the factor of Continental supply whenever we are unable to explain the abundance of a particular insect. These thoughts have been called forth by Mr. Colthrup's remarks (*loc. cit.*) concerning *Porthesia chrysorrhæa*. All that can be said is that we have had a "good year" for this species both here and on the Continent. My reason for offering this contribution to the discussion is that I noted the abundance of this insect this autumn in North Wales, all along the coast from Colwyn Bay to Penmaenmawr, and inland about Capel Curig. There is no direct Continental communication with this coast.—(Prof.) R. MELDOLA; 6, Brunswick Square, W.C., Dec. 6th, 1902.

"EMPEROR OF MOROCCO."—This has been used as the name of a butterfly; but I am only acquainted with the two instances quoted in

Murray's 'New English Dictionary'—'Peter Pindar's Poems,' in which the insect *may* be the purple emperor, and Bulwer Lytton's 'Kenelm Chillingly,' where *Papilio machaon* seems to be the butterfly intended. Has any entomologist met with this term as the name of a butterfly in any other book, or orally?—W. F. KIRBY.

VANESSA ANTIOPA.—*A propos* of the var. of *V. antiopa* recorded by Mr. Oldaker (*ante*, p. 285), it occurs to me to mention that while in charge of the American Church, Geneva, November, 1898, to April, 1899,—on April 6th in the latter year, while at Etiennehus and searching for insects at the foot of the Petit Salene—I observed, but unfortunately failed to capture, a particularly large and fresh specimen of *V. antiopa*. Its border was pure white, and was evidently in fresh condition. The white could not have been a case of fading from an originally sulphur hue. The following is an extract from my journal of that date:—"A splendid specimen of *V. antiopa* settled three or four times in front of me, but I failed to secure it, owing to the loose slopes of stone and shale under one's feet. It had a border of pure white. I failed, as far as I could perceive, to discern any blue spots. It was in very fine and fresh condition."—(Rev.) F. A. WALKER; Dun Mallard, Cricklewood, N.W., Nov. 1st, 1902.

CAPTURES AND FIELD REPORTS.

BOARMIA ROBORARIA IN SURREY. — On June 22nd, 1902, whilst collecting at Addington, near Croydon, I took a fine male specimen of *B. roboraria*, at rest on a birch-trunk. I should very much like to know if there are any other records of this species having been taken at Addington or Shirley.—B. STONELL; 25, Studley Road, Clapham.

NOTES FROM SUFFOLK.—On June 8th last I took a fresh-emerged specimen of *Colias hyale*. While collecting in East Suffolk in June I took a good series of *Cybosia* (*Lithosia*) *mesomella*. I have never before met with it in this county. The dark variety of *Nonagria neurica*, which is, I believe, considered rare, has been as frequent this season as the ordinary type.—HENRY LINGWOOD; Needham Market, Suffolk.

LYCÆNA ASTRARCHE (AGESTIS).—Referring to Mr. Oldaker's remarks on this species (*Ent.* xxxv. p. 324), I must say that my experience does not quite agree with his. I have seen this butterfly in some numbers, on more than one occasion, near Tring, although sometimes it is scarce. On June 4th, 1900, it was particularly plentiful, and I took fourteen specimens in a very short time, and could have taken many more.—PHILIP J. BARRAUD; Bushey Heath, Herts.

EARLY EMERGENCE OF PHIGALIA PEDARIA.—I took a fine male *P. pedaria* on Dec. 15th last. The moth was sitting on a tree-trunk in this neighbourhood, and was evidently freshly emerged.—B. H. CRAB-TREE; The Acacias, Levenshulme, Manchester, Dec. 17th, 1902.

LEPIDOPTERA AT WALLINGTON.—During the season several more or less local moths were abundant in my garden here. The most note-

worthy of these were *Charocampa porcellus*, *Apamea ophiogramma*, *Triphæna interjecta*, *Tethea subtusa*, and *Plusia moneta*; in fact, in the middle of July *ophiogramma* and *moneta* were in numbers over all the plants, and I might have captured, on an average, thirty specimens of the latter a night, had I been so disposed. Single examples of *Cirrhædia xerampelina* and *Calymnia diffinis* were also taken. Since the time of the capture of *P. moneta* I have been diligently searching for the larvæ of the species on *Delphinium*, which abounds in the garden, but so far my efforts have been unavailing.—LESLIE H. MOSSE-ROBINSON; Wandle Bank, Wallington, Surrey, Oct. 24th, 1902.

SWISS LEPIDOPTERA, 1902.—My father and I arrived at Montreux on May 25th, and took up our abode at the 'Hôtel de Montreux,' close to the station, which was to be our headquarters for the ensuing fortnight. After lunch we went to Veytaux, with our nets, to prospect. The weather was fine and hot, but the mountains were almost obscured by a thick haze. We met with butterflies before we got clear of the houses. Several *Vanessa antiopa* showed themselves, but kept well out of reach. Farther on in the meadows we obtained the following:—*Gonepteryx rhamni*, *Leucophasia sinapis* (common), *Euchloë cardamines*, *Argynnis dia* (one), *Vanessa c-album*, *Cænonympha pamphilus* (common), *Lycæna argiolus* (one male), *L. icarus*, *L. alsus* (common), *Euclidia glyphica* (common), *Venilia maculata*, *Ematurga atomaria*, *Strenia clathrata*, *Scoria dealbata*, *Minoa murinata*, *Emmelesia albulata*, *Crambus pratellus*, and *Erastria deceptorica* (one).

On the 27th we started for Les Avants, *viâ* the Gorge du Chaudron. Les Avants itself, though producing any quantity of narcissi, did not yield any insects worth taking; but in the clearings in the Gorge we met with more success. Most of the species taken at Veytaux occurred here, and in addition:—*Colias hyale*, *Argynnis euphrosyne*, *Melitæa aurinia*, *Pararge hiera*, *Thecla rubi*, *Lycæna acis*, *Nemobius lucina*, and *Syrichthus malvæ*.

28th.—A very hot day. We went up through the Bois de Chillon to the foot of the snow on the Rochers de Naye, but met with no fresh species except *Tephrosia consonaria* and *Vanessa urticæ*. The latter, which seemed to be uncommon, together with *Euchloë cardamines*, *Lycæna alsus*, and *Nisoniades tages*, were on the wing at the highest point we reached (about 4000 ft.).

29th.—Obtained a specimen of *Carterocephalus paniscus* at Veytaux, and the following at Villeneuve in the afternoon by beating some bushes bordering a very marshy meadow:—*Plusia chrysitis*, *Larentia viridaria*, *Eupisteria obliterata*, *Hypsipetes impluviata*, and *Eubolia plumbaria*.

30th.—Went to Villeneuve by boat, and walked from there to Aigle and back (about six miles each way). Lepidoptera were fairly plentiful near Aigle. I obtained a very good series of *Erebia medusa*, and took two *Papilio podalirius*; the latter rather the worse for wear. We were also able to add the following to our list of captures:—*Argynnis selene*, *Melitæa cinxia*, *M. athalia*, *Pararge megæra*, *P. egeria*, *Hesperia sylvanus* (common), and *Lycæna cyllarus* (one).

31st.—Walked to the Bains de l'Alliaz, passing through Blonay. The latter is the most picturesque village of the neighbourhood,

though very odoriferous. Took one *Colias edusa*, female, var. *helice*, one *Vanessa antiopa*, and another *Pararge hiera*.

June 1st (Sunday).—A very hot day.

2nd.—Visited St. Gingolph and Bouveret. Terrifically hot, but fortunately no flies to worry us. Met with no fresh species.

3rd.—Caught in a storm at Blonay. *Vanessa cardui* was common between that place and Montreux.

4th.—A dull day with clouds low down over the mountains. Went up above Caux to get a few roots of plants, such as gentian, &c. Total entomological bag, one *Erastria deceptor*ia.

5th.—Paid another visit to Aigle, going over much the same ground as before. Caught another *Papilio podalirius* in very fair condition, and a good series of *Aporia cratægi* (males), evidently just out. *Epinephele hyperanthus*, *Polyommatus dorilis*, and *Zygæna trifolii* met with for the first time.

Thus ended a very delightful and successful holiday. It will be observed that we attempted no night work. This was partly because we were generally quite ready for bed by the time supper was over, and partly because there was nothing to be got within reasonable distance. We saw no moths around the numerous electric lamps after dark.—PHILIP J. BARRAUD; Bushey Heath, Herts.

LEPIDOPTERA IN NORTH DORSET, 1902. — The earlier part of the season was one of the worst I have ever experienced. East winds and fogs followed by cold nights and much wet in the early summer made even the commonest insects scarce. Sugaring was a total failure (not even *Mamestra brassicæ* being attracted) until September, when it began to be fairly remunerative. I append a list of moths, most of which were taken at light, sugar, or ivy within a quarter of a mile of my house, the remainder by beating and dusking. Besides those specially mentioned, many other commoner species were seen or taken without any particular note being made of time or place. I should mention I was away from home from July 28 to Sept. 10, so that many species were missed. List:—*Charocampa elpenor*, July 16. *Phragmatobia* (*Spilosoma*) *fuliginosa*, May 6. *Porthesia auriflua*, Sept. 26. *Trichiura cratægi*, Sept. 21–25. *Pæcilocampa populi*, Nov. 1–30. *Malacosoma* (*Bombyx*) *neustria*, Sept. 24. *Odonestis potatoria*, July 16–24. *Cilix glaucata*, June 3. *Dicranura* (*Cerura*) *vinula*, June 3–10. *Bryophila perla*, July 24. *Diloba ceruleocephala* (males), Oct. 23–28. *Leucania pallens*, Sept. 26–27. *Hydræcia micacea*, Sept. 25. *Xylophasia sub-lustris*, Sept. 13. *Luperina testacea*, Sept. 24–Oct. 10. *Miana arcuosa*, July 24. *Agrotis puta*, Sept. 10–22. *A. suffusa*, Sept. 12–Oct. 11. *A. saucia*, Nov. 15. *A. segetum*, Oct. 28–30. *Noctua plecta*, Sept. 10. *N. c-nigrum*, Sept. 13–30. *N. rubi*, Sept. 12–21. *N. neglecta* Sept. 21. *Amphipyra pyramidea*, Sept. 13–21. *A. tragopogonis*, Sept. 14–21. *Tæniocampa gothica*, April 2. *T. stabilis*, March 16. *Orthosia lota*, Oct. 19–Nov. 15. *O. macilenta*, Oct. 24–Nov. 11. *Anchocelis pistacina*, Sept. 23–Nov. 15. *A. lunosa*, Sept. 19–26. *A. litura*, Sept. 27–Oct. 13. *Cerastis ligula* (*spadicea*), Oct. 28–Nov. 15. *Scopelosoma satellitia*, Oct. 18–Nov. 15. *Xanthia aurago*, Oct. 24. *X. circellaris*, Oct. 10–Nov. 15. *Polia flavicincta*, Sept. 10–Oct. 17. *Miselia oxyacanthæ*, Oct. 25–30. *Phlogophora meticulosa*, Oct. 1–31. *Calocampa exoleta*,

Oct. 13–Nov. 5. *Xylina ornithopus*, Oct. 17–Nov. 11. *X. socia*, Oct. 15–29. *Asteroscopus sphinx* (*P. cassinea*), Nov. 23–27. *Gonoptera libatrix*, June 3 and Sept. 10. *Habrostola triplasia*, July 4–10. *Plusia iota*, July 5. *P. gamma*, Nov. 2. *Rumia luteolata* (*cratagata*), May 10–Sept. 20. *Ennomos alniaria* (*tiliaria*), Sept. 21–30. *E. fuscantaria*, Sept. 23. *Himera pennaria*, Oct. 25–Nov. 2. *Biston stataria*, March 6. *Amphidasys betularia*, June 5. *Boarmia rhomboidaria*, July 23. *Zonosoma annulata*, July 10. *Asthena luteata*, July 10–13. *Acidalia remutaria*, June 3. *Halia wavararia*, Sept. 10. *Ligdia adustata*, July 5–13. *Lomaspilis marginata*, June 3. *Hybernica rupicaprararia*, March 6. *H. leucopheararia*, Feb. 28. *H. defoliaria*, Nov. 30. *Anisopteryx æscularia*, Feb. 28–March 31. *Oporabia dilutata*, Oct. 18. *Larentia viridaria*, June 3. *Melanthia bicolorata*, July 13. *Melanippe sociata*, June 8. *M. montanata*, June 8. *M. galiata*, July 5. *Anticlea rubidata*, July 4–10. *A. badiata*, April 2–May 10. *Coremia designata*, June 8. *Camptogramma bilineata*, July 13–20. *Coremia ferrugata*, June 3. *Phibalapteryx tersata*, July 4–13. *Triphosa dubitata*, Sept. 18. *Eucosmia certata*, May 22–26. *Scotosia rhamnata*, July 10. *Cidaria miata*, Sept. 26–Nov. 5. *C. truncata*, Sept. 26. *C. immanata*, Sept. 18–26. *C. associata*, July 4–17. *Eubolia cervinata*, Sept. 23–Oct. 5. *Tinagra atrata*, July 19. As a whole, the year was a poor one in regard to the total number of species and specimens taken, but, notwithstanding, there were some good captures for the district; amongst the best being *C. elpenor*, *T. cratagi*, *P. populi*, *H. micacea*, *A. puta*, *P. flavicincta*, *E. fuscantaria*, *A. sphinx*, *X. socia*, *C. miata*, *X. aurago*, and *E. certata*. My friend Mr. C. W. Dale informs me that the two last are now recorded for the first time in the county; also that *A. litura*, though commonly taken, is inadvertently omitted from his 'Lepidoptera of Dorsetshire.' There are several curiosities in the matter of dates which may be noticed. They are mostly of late occurrences, and illustrate the abnormal character of the season; amongst others, *G. libatrix*, June 3—this I think, by the way, was the only specimen of any kind taken at sugar up to then; *M. neustria*, Sept. 24; *P. auriflua*, Sept. 26; *L. pallens*, Sept. 26–27; *P. gamma*, Nov. 2—all unworn specimens taken at light, and, in the case of *P. auriflua* and *L. pallens*, apparently just emerged. I might add that, with regard to our local Rhopalocera, the weather prevented visits being paid to the haunts of *Leucophasia sinapis* and *Nemeobius lucina*, but *Melanargia galatea* and *Melitæa aurinia* were found at home. None of the Coliades were seen, nor did *Sphinx convolvuli* put in an appearance.—JAMES DOUGLAS; Sherborne, Dorset.

COLLECTING IN YORKSHIRE IN 1902.—From Aug. 5th to Sept. 8th this year I was in different parts of Yorkshire, and made expeditions to various localities. The first two weeks were cold and damp, but after that the weather improved, but there was generally a scarcity of insects, no doubt owing to the wretched apology for a summer that we have had. The heather was three weeks later than usual in flowering on the moors. One *Colias edusa* was met with near Bridlington on Sept. 5th, a male in perfect condition. I visited the locality again next day, but could not find another. *Melanargia galatea* was seen in three localities within easy distance of York: in one spot I saw over

sixty, and netted a dozen of them. *Argynnis aglaia* was out in several places in small numbers. Others, seen at times, included *Lycæna icarus*, *L. agestis*, *Hesperia linea*, *Vanessa atalanta*, *V. urticae*, *Ctenonympha pamphilus*, *Epinephele ianira*, *Pieris brassicae*, *P. napi*, *P. rapae*, *Zygæna filipendulae*, &c., but no *Vanessa io* or *Epinephele hyperanthus*, which are usually to be found in some of the places visited. *Plusia gamma* was just coming out on the moors with *Charaxes graminis*. The latter was abundant on Dalby Warren on Sept. 1st, bustling about the clumps of bracken, in spite of the rain that was falling. A few worn *Anarta myrtilli* and one fresh *Hypsipetes elutata* were kicked up out of the heather. Larvæ of *A. myrtilli*, *Macrothylacia rubi*, and *M. quercus* var. *callunæ* were frequent, with a few *Saturnia pavonia* and some *Vanessa atalanta* just pupating. The only dragonfly identified was *Sympetrum scoticum*, which was abundant near the head-waters of the Derwent. *Cicindela campestris* was, as usual, common, but I was unable to find any *Carabus nitens* where it was plentiful five years ago. Long walks or cycle-rides over the moors near Whitby, Pickering, and Scarborough, and over the wolds between Malton and Driffield, furnished several species of galls. *Salix repens* on Dalby Warren seemed to bear more than usual of the bright red ones, but those of *Euura pentandra* on *Salix pentandra* were scarce, there being only a few fresh ones to be found. One I had not seen before was a crimson cup-shaped gall, arranged in rows along the midrib of the leaves of *Spiræa filipendula*. The different cells were connected by a solid wall of tissue, and each one examined was occupied by a fully-formed pupa of a small species of Hymenoptera, though whether this was the maker or only a parasite I cannot say. If the latter, then they had carefully removed all traces of their hosts. Another one was on *Rubus idæus*, made by larvæ of a *Cecidomyia*. Several species of oak-galls were more numerous than usual in the woods bordering the moors.—HAROLD J. BURKILL; 79, Cornhill, E.C.

COLLECTING IN THE NEW FOREST.—After many fruitless attempts to obtain rooms at Brockenhurst, my father and I eventually found ourselves, on Aug. 1st, at Bank, where we stayed for ten days. I suppose that nobody will have much to say in favour of the season 1902, for it has been quite one of the worst I can remember. We had no really hot weather during the ten days, and rain was frequent. On the whole, I think that collecting was as good as could be expected, larvæ, at any rate, being plentiful. Among the latter were *Smerinthus ocellatus* (a few from crab-apple), *Macroglossa fuciformis* (two, honey-suckle), *M. bombyliiformis* (scabious, one), *Euchelia jacobææ* (abundant), *Lithosia aureola* (?), *Nola cristulalis*, *Halias prasinana*, *Orgyia antiqua*, *Dasychira pudibunda* (common, but small), *Psilura monacha* (one full-grown, from beech). *Saturnia carpini* (two), *Macrothylacia rubi*, *Drepana falcatoria* (two), *D. lacertinaria* (one), *Phalera bucephala*, *Clostera reclusa* (on dwarf willow), *Stauropus fagi* (one), *Ptilodontis palpina* (two), *Lophopteryx camelina* (some full-grown, others quite small), *Notodonta dromedarius* (one), *N. trepida* (one, full-grown), *N. chaonia*, *N. dodonea*, *Diphthera orion* (eight very small ones fell from one beat, and other larger ones were taken), *Trachea piniperda* (one or two), *Anarta myrtilli*, *Tæniocampa stabilis*, *Ennomos erosaria*, *E. tiliaria*,

Eurymene dolabraria, *Amphidasys betularia*, *A. prodromaria*, *Boarmia consortaria*, *Tephrosia extersaria* (*luridata*), *Pseudoterpna cytisaria* (on *genista*), *Ephyra punctaria* and probably *E. porata*, *E. pendularia*, *Macaria liturata*, *Bapta taminata*, *B. temerata*, *Eupisteria heparata*, *Ematurga atomaria*, *Cidaria psittacata* (*siderata*). The examples since bred from the last-named are a grand deep colour. A notable absentee from my list is *Acronycta albi*, of which species the larvæ appear to have been commoner than usual this year, several other collectors obtaining it.

Turning to the butterflies, *Pieris napi* was abundant, but very few *P. rapæ* were seen. *Gonepteryx rhamni*, abundant. *Argynnis* (*Dryas*) *paphia*, abundant as usual. A number of var. *valesina* were seen, but were mostly in poor condition. *Epinephele ianira*, *E. tithonus*, and *E. hyperanthus*, all common. *Cænonympha pamphilus*, abundant. *Satyrus semele* was common on the heaths. *Vanessa urticae*, common. *V. polychloros* was just coming on the wing and was in grand condition. Several examples were seen on the old treacle patches, and it also seemed fond of sunning itself on the tree-trunks and palings late in the afternoon. *Limnitis sibylla*, plentiful and in poor condition. *Thecla quercus*, abundant and fine. *Lycæna ægon*, abundant and fine. *Hesperia sylvanus*, *H. thaumas*, both fairly common. A short dumpy green pupa, taken hanging from a log of wood, proved to be *Pararge egeria*.

Day-work and dusking, the latter very bad, produced about seventy species of moths, among which were the following:—*Sarothripus undulatus* (half a dozen, in first-rate condition, beaten from oak and beech), *Gnophria quadra* (a few, very worn), *Lithosia helveola* (two males), *L. griseola* and var. *stramineola* (one of each), *Calligenia miniata* (one in a spider's web), *N. strigula*, *Limacodes testudo* (one), *Lasiocampa quercus* (males abundant flying over the heather; one female, at rest on heather, deposited a number of fertile ova), *Psilura monacha*, *Drepana cultraria*, *Noctua stigmatica*, *Heliothis dipsaceus* (seen, but missed after a long chase), *Erastria fuscula*, *Aventia flexula*, *Ennomos erosaria*, *Cleora glabraria* (two fine examples), *C. lichenaria* (one, very worn), *Pseudoterpna cytisaria*, *Gnophos obscurata* (locally abundant), *Selidosema plumaria* (very local, a number of males in first-rate condition), *Ephyra trilinearia*, *Acidalia trigeminata*, *Eupisteria heparata*, *Macaria liturata*, *Pachynemius hippocastanaria* (worn), *Emmelleia alchemillata* (one, at dusk), *Melanthia albicillata* (very fine), and *Botys lancealis*.

Treacle was a decided failure, the following being the only species noticed:—*Nola strigula* (two), *Gnophria quadra* (one), *Xylophasia polyodon*, *X. hepatica* (worn), *Thyatira batis*, *Gonophora derasa*, *Amphipyra pyramidea*, *Cosmia trapezina*, *Catocala sponsa* and *C. promissa* (both just coming out and not very abundant), *Gonoptera libatrix* (one), *Hypenodes albiguttalis* (?).

A number of species came indoors to light. We found it a good plan to put the acetylene lamp in the window. The following were attracted:—*Lithosia lurideola* (one), *Porthesia similis*, *Lophopteryx camelina* (one), *Xylophasia polyodon*, *Apamea oculatea*, *Caradrina* (? *blanda*), *Triphæna interjecta* (one), *T. ianthina*, *Bryophila perla*, *Selenia illuminaria* (males), *Epione apiciaria* (one), *Boarmia rhomboidaria*, *Iodis vernaria*

(one), *Crocallis elingvaria*, *Pseudoterpna cytisaria*, *Cabera exanthemata*, *Acidalia aversata*, *Melanthia ocellata*, *Lomaspilis marginata*, *Abraxas grossulariata*, *Botys lancealis*, *B. ruralis*, *Scopula prunalis*, *Nomophila noctuella*, *Aphomia sociella*, and numerous *Micros*.

The Odonata noticed were:—*Sympetrum striolatum*, *S. scoticum* (one), *Pyrrhosoma nymphula*, *P. tenellum*, *Ischnura elegans*, *Enallagma cyathigerum*, *Platycnemis pennipes*, *Orthetrum carulescens* (abundant), *Calopteryx virgo*, *Aeschna* (*cyanea* ?) and *Cordulegaster annulatus*.

A number of Coleoptera were taken, but I have only the names of a few. A dead rabbit in a peculiarly decomposed condition was discovered in Queen's Bower, and yielded *Silpha rugosus*, *S. sinuatus*, *S. littoralis*, *Necrophorus* (? sp.), *Saprinus nitidulus* (abundant), various *Histers* (not identified), *Philonthus æneus*, and *Creophilus maxillosus*. A specimen of the large *Prionius coriarius* was taken at treacle, but was unfortunately minus one of the elytra. *Carabus* (? *catenulatus*) and females of *Lucanus cervus* also came to treacle. The following were also taken:—*Cicendela campestris* (one), *Silpha atratus* (one), *Athous hæmorrhoidalis*, *Agriotes sobrinus*, *Aphodius rufipes*, *Anomala frischei* var., *Strangalia armata*, *Leptura livida*, and many others yet to be determined.—F. M. B. CARR; care of Rev. A. G. Robertson, M.A., The Close, Salisbury.

NOTE ON THE SEASON AT CHICHESTER.—Without doubt the present year will be remembered in most localities as the worst season for Lepidoptera on record, and so far as my own experience goes I have never known such a bad one for collecting. Under such conditions, perhaps, the record of almost any insects is useful and interesting, and with this view this note is written. Geometers were especially scarce, *Anticlea rubidata*, which appeared first on July 16th, being about one of the best species seen. On July 17th a *Geometra papilionaria* was taken, at rest on a window-sill in the street. During May three or four larvæ of *Gastropacha quercifolia* were found at Apuldram by Mrs. Fogden. *Zeuzera æsculi* was taken during August. On Oct. 1st a male *Eugonia autumnaria* (*alniaria*) was secured, seated on a house in the daytime. Sugaring was quite useless, the only moth worth noting being *Mania maura*.—JOSEPH ANDERSON.

SUBURBAN NOTES, 1902.—Owing to various reasons we were unable to do much collecting at home during the past season, but, nevertheless, although Lee is rapidly becoming a part of London, one or two unusual species put in an appearance. A few examples of *Biston hirtaria*, which seems to be scarce with us, were noticed in April. A specimen of *Taniodampa instabilis* (*incerta*) was seen as late as May 24th. The first brood of *Cyaniris argioides* was not so common as last year, and apparently about a fortnight later, viz. end of May and beginning of June. A larva of *Lasiocampa quercus* was taken in the garden at the end of May. A male *Anthocharis cardamines* was seen on June 1st, in the Eltham Road. A few *Smerinthus tilia* turned up in June and July, and the larva of the same species in August. July produced a few more notable species, the most remarkable being a fine specimen of *Earias chlorana*, taken from a paling over which hangs a willow-tree. This species, I believe, was common here

many years ago. Single examples of *Apamea ophiogramma*, *Hepialus humuli* (formerly common enough), and *Zeuzera æsculi* were taken; also *Phibalapteryx tersata*. I first noticed *Mania maura*, which is common with us, on July 15th, and it continued in great abundance into September. In August *Pelurga comitata*, *Halia vauaria*, and a few *Hepialus sylvanus* appeared; also the second brood of *Cyaniris argioides*, about the middle of the month. Two boy-friends, who have just begun collecting, obtained three larvæ of *Cerura bifida* from Brockley, which is about four miles from London Bridge. In September several *Vanessa io* were noticed at Lee and in Greenwich Park. Among the visitors to treacle in this month were *Agrotis suffusa*, *Hydræcia micacea*, and *Catocala nupta*.—F. M. B. CARR; The Choristers' School, The Close, Salisbury.

NOTES FROM ROMFORD, ESSEX.—I have simply done nothing here this year, except at light, which was fairly productive. That was the only way I knew whether anything was flying, as the species which usually come to sugar put in an appearance at light instead. As for sugar, it was hopeless. Up to the beginning of August not a moth of any kind. For the first week of August a few *Noctua xanthographa*. After that I cannot say what occurred, as I went for a holiday and did not entomologize much. Since I returned home it is as bad as ever. Even *Anchocelis pistacina* is only coming to light. Can anyone explain this failure of sugar in a particular district? It is so all round here, and it cannot be the quality of the sugar, as I used the same mixture a few times at Weymouth, and plenty of moths came to it.—(Rev.) W. CLAXTON; Navestock Vicarage, Romford, Oct. 6th, 1902.

NOTES FROM THE CHESTER DISTRICT.—The chief features of the season 1902 have been a low temperature and a lack, on the whole, of insects. The only Lepidopteron which could be marked, in my experience, as plentiful, was *Brephos parthenias*—in Delamere Forest—in March, but more especially in the early part of April. Twenty specimens were taken, by day and night, on April 4th. They were found, after dark, by the aid of a lamp, resting on birch, and one on sallow bloom. May was chiefly devoted to a search for *Anticlea derivata*, in the hope of getting eggs. Night after night we plunged through the mud-holes of King's Wood Lane—cold and often rainy the nights were, and very different from those of last year—but the total sum was a couple of examples, male and female, and, as the latter had already deposited her eggs, the result was failure.

There was fine warm weather in June and July, and Delamere Forest saw us frequently. *Cænonympha davus* was scarce, through over-collecting, in comparison with last year. None of the specimens I captured showed the large spots referred to last season (Entom. xxxiv. p. 257), but some are very liberally and clearly spotted. Perhaps the best is a female, showing a row of pointed spots on the upper surface of the hind wings near the margins. In one part of the forest district there is a nice and boldly-marked form of *Ematurga atomaria*. My best capture in this line was a female, the prominent characters of which are an unusually broad black band near and parallel with the outer margins of both fore and hind wings, and a dusting, chiefly

basal, of yellowish scales. Other Delamere captures worth noting are a female *Melanthia albicillata*, two *Acronycta menyanthidis*, and three good examples of the sooty form of *Macaria liturata* var. *nigrofulvata*, all in July.

Electric lamps, owing to the unsatisfactory weather, were very much of a failure. About a dozen *Dicranura bifida* were captured, but all were males; a couple of *D. furcula*—males again, and the same sex was represented in all the black *Amphidasys betularia* I took. A few *Notodonta dictæa* turned up—males again; in fact, it is puzzling why male insects, chiefly, come to the lights. A fine dark *Cerigo matura* (cytherea), July 23rd; a *Leucoma salicis*, Aug. 1st; *Habrostola triplasia*, *Triphæna ianthina*, *Drepana binaria* (hamula), *Acidalia incanaria*, and *Epione apiciaria*—all in August; *Nonagria typhæ* and *Eupithecia centaureata* in September, are the best things I gather from my notebook. One example each of *E. apiciaria* and *E. centaureata* were females, and from these I obtained eggs. Those of *E. centaureata* were white, and hatched Sept. 19th. The tiny larvæ are now feeding on ragwort flowers. The eggs of *E. apiciaria* are reddish, with whitish blotches, and they will lie over the winter, I suppose, before hatching. Now and then a big *Smerinthus ocellatus*, or *S. populi*, invariably males, would flop down at the foot of a lamp in June. But the temperature dropped so about the middle of July that people took to overcoats, and the lamps became hardly worth working.

By far the most interesting work of the season was a closer acquaintance with the district larvæ. *Agrotis ashworthii* began emerging from the chrysalis, July 1st. All the imagines were of the usual stereotyped shade and pattern. The first *A. lucerneæ* appeared, July 13th, and in the series bred I got a fine dark specimen, the pale wing-fringes showing up conspicuously. July 12th one of our party found a lot of eggs of *Macrothylacia rubi* in Delamere Forest. They were laid in clusters on the pendent wire-like blades of cotton-grass. How a big, heavy, moth-like *M. rubi* managed to do this is rather puzzling, but I suppose her weight pulled down the blades, which afterwards rose again with their burdens. The eggs were entrusted to me. Many of them were infertile, and the rest hatched July 18th. Since that date the larvæ have been forced, and they were all full-grown by Sept. 14th. They are still eating a little, Oct. 16th. Of course, my object is to get them to skip the hibernating period and pupate, but whether I succeed or not seems doubtful. All along I have fed the larvæ on sallow, which they evidently like.

The great object of the summer was to see—remembering that the perfect insects are not rare at the electric lamps—how and in what numbers the larvæ of *Dicranura bifida* and *D. furcula* could be found by close searching. *D. vinula* we saw in all its stages—the russet-coloured egg, the young caterpillars like black strokes on the sallow or poplar leaves, and the caterpillars full-grown or nearly so. From a single poplar-bush—say a couple of yards wide and forming part of a hedge—I picked, July 26th, twenty-one for some young friends. Possibly they formed two separate broods, for about half were in the final, while the remainder were in the preceding stage. Then there was *Smerinthus ocellatus*; in one afternoon in the middle of August we

counted seventy larvæ of this species. There were old acquaintances: *S. populi* (plenty of them), *Orgyia antiqua*, *Odonestis potatoaria* (eggs), *Portesia similis* (*auriflua*) (larvæ, pupæ, imagines and eggs all at the same time), *Acronycta alni* off birch (only two, but possibly male and female), *Notodonta dictæa* (a few), *Gonoptera libatrix*, *Nonagria typhæ*, and a caterpillar I have never before met with in the district, although the moth is common enough at the electric lamps—*A. megacephala*. Both *D. bifida* and *D. furcula* were scarce July to September, especially the first species. Three caterpillars of *bifida* and seven of *furcula* were the totals for each. The *bifida* were all off poplar, while *furcula* favoured both poplar and sawlow. There was a good deal of difference between the caterpillars of each. Both have a pattern along the back which looks like a purplish dorsal hood and mantle bordered with yellow. In *D. bifida* the hood is separated from the mantle; in *D. furcula* the two are connected, but almost separated at segment 4. Then the mantle in *furcula* is always ornamented with bright russet, the same tint as on the upper wings of the moth *G. libatrix*.

In September and October larvæ of *M. liturata*, *Bupalus piniaria*, and *Ellopiopsis prosapiaria* (*fasciaria*) were beaten from Scotch firs in Delamere Forest. *Liturata* were not very common. One day, Oct. 4th, I got three, whilst a companion was lucky enough to get nine. *Fasciaria* was a common caterpillar; it looks, roughly speaking, very like *A. betularia*. Some of the specimens were marbled with dark green, others with red. Autumn imagines of *Thera variata* were on the wing, and a good many of their little green pupæ were beaten out of the Scotch firs. From these (Oct. 17th) I am getting some very pretty moths. The only other Delamere Forest larvæ worth referring to were those of *Aplecta nebulosa*, captured on April nights, from which were reared very representative series of moths, culminating in the darkest forms.

Among dragonflies I was agreeably surprised, in July, to get *Platetrum depressum* in Delamere Forest. The most important observation was a second and very general appearance of *Ischnura elegans* in the beginning of August.—J. ARKLE; Chester, Oct. 17th, 1902.

THE SEASON OF 1902.—With regard to rearing Lepidoptera I have noticed two things during the past season: first, that larvæ have, as a rule, taken longer to feed up than usual; and, secondly, that a greater percentage have died than is generally the case. To take the insects in something like order, my first imago, from a brood of *Sphinx ligustri*, appeared on June 7th, *Hyloicus* (*S.*) *pinastri* (bred from foreign ova) having emerged on June 2nd. Only one out of seven pupæ of *Charocampa elpenor* came through, and that was not a very good specimen. It emerged on June 1st, which is three weeks earlier than my entry for this species in 1901. I found two larvæ early in September, and the first of these went down to pupate on September 25th. *Smerinthus ocellatus* imagines began to appear on June 18th, which is over a month later than the first entry for last year. *Dilina* (*S.*) *tiliæ* emerged on April 26th and following days, whereas in 1901 the first did not come out till May 29th. That is all I have done with the "hawks" this year. The larvæ of *Zygana filipendulæ* were fairly common at the beginning of July, and the first imago appeared in my

breeding-cage on July 26th. Some ova of *Ænestis* (G.) *quadra* were sent me in July, and I did not expect the larvæ to emerge till next spring. They appeared, however, on August 1st, and though I tried them with lichen from various trees, none of them ate anything at all, as far as I could see, and all were dead within a week. The imagines of *Hipocrita* (E.) *jacobææ* were plentiful here during the latter end of May and the beginning of June, and I never saw so many larvæ before as there were during July. They began to go down on July 22nd. Wherever ragwort occurred there seemed to be a brood of them, and a friend of mine, who is a botanist as well as an entomologist, observed a batch of larvæ feeding on the greater knapweed. A fine larva of *Arctia caia*, which I found crawling on an asphalt path, pupated on June 20th, and the imago appeared on July 12th. I took several females, and got a great number of ova, which I put down in a bed of nettles, and I shall examine the larvæ next spring, if all goes well. On June 20th the first imago of *A. villica* came out, and on the 23rd a brood of larvæ of *Euproctis* (P.) *chrysorrhæa* pupated. The resultant imagines came out from July 15th till about the first week in August, and I am very glad to have finished with this obnoxious insect, as I once got very badly stung when changing the food of the larvæ. Imagines of *Dasychira pudibunda* came through on April 23rd, from pupæ found in the autumn of 1901. *Trichiura cratægi* is one of the species I have bred right through this year. The young larvæ appeared on April 18th, but by the time the last change of skin had taken place, there were only half a dozen left out of about twenty. Of these only two attained the perfect state, a male emerging on Aug. 30th, and a female on Sept. 7th. On June 9th I discovered a batch of larvæ of *Malacosoma* (B.) *neustria* sunning themselves on a blackthorn bush at Bembridge, Isle of Wight, and as I had bred a series last year on apple, I thought I would take these to see if they differed at all. The result fully justified the trouble, for the males of this year's brood are much darker, and the females much smaller, than last year's; in fact, if I had not bred both from the larva, I should not have taken them for the same species. The rest of the imagines from my batch of *Lasiocampa* (B.) *quercus* larvæ, bred last year, came through towards the end of June this year; so that the full history of these is: four larvæ spun up on May 16th, 1901, and the imagines emerged from July 12th to 19th; the rest went on feeding till August, and the moths emerged from June 28th to July 22nd, 1902. Are these latter to be called var. *callunæ*? They are absolutely identical with the others, and all are, as I have said, from the same batch of larvæ. A fine larva of *Gastropacha* (L.) *quercifolia*, which pupated on June 20th, produced an imago on July 9th. On April 21st an example of each sex of *Saturnia pavonia* emerged; they paired immediately, and by the next morning the female had deposited 252 ova, most of which proved fertile. The resultant larvæ appeared on May 31st, and pupated on July 27th. Several pupæ of last year's brood are standing over till next year, as are also a whole brood of *Endromis versicolor*. I reared *Drepana lucertinaria* and *D. falcataria* from ova. The dates for these are: *Lacertinaria*, larvæ, June 5th; pupæ, July 6th; imagines, July 16th. These are much larger and lighter in colour than some that were sent me

recently from Bexley. *Falcataria*, larvæ, June 13th; pupæ, July 7th; imagines, July 17th. These, curiously enough, are smaller and darker than some sent me from Bexley. A very healthy brood of *Dicranura vinula* devoured a great deal of willow from June 25th till July 27th, when the first one began to spin up. The imagines from last year's brood of *Pterostoma palpina* appeared at intervals between May 14th and 29th, and *Lophopteryx camelina* between May 28th and June 11th. *Notodonta dromedarius* is one of my total failures this year, for the young larvæ which emerged from ova on July 6th entirely refused to eat. A very good series of *N. ziczac*, varying nicely in colour, came out on April 16th and 20th, June 8th, 10th, 21st, and 24th. I was very successful with the three "chocolate tips": *Pygæa curtula*, larvæ, June 19th; pupæ, July 15th; imagines, July 28th. *P. anachoreta*, larvæ, May 1st; pupæ, June 19th; imagines, June 30th. *P. pigra*, larvæ, June 25th; pupæ, July 26th; imagines, Aug. 14th. Among the Noctuæ, some fine imagines of *Acronycta aceris* emerged on June 21st; some larvæ of *Diloba ceruleocephala* spun up on July 11th, and the resultant imagines began to appear on Oct. 29th, and two pupæ of *Agrotis puta* yielded perfect insects on May 14th and 15th. A batch of ova of *Polia chi* hatched on March 23rd, and fed up very well on whitethorn till May 29th, when the first went down. A fine series of imagines began to appear on July 16th, with a good range of shades, but none was dark enough to be referred to the variety *olivacea*. Some larvæ of *Miselia oxyacanthæ* fed and thrived very well till May 23rd, when they went down, but only two succeeded in pupating, and these died before the end of July. Only two out of about three dozen larvæ of *Agriopsis aprilinu* reached the final stage, most of them dying off when quite small; two fine imagines, however, appeared, one on Sept. 28th, and the other on Oct. 2nd. A brood of *Amphipyra pyramidea* died off altogether, after feeding up well till June 8th.

Of the Geometræ, about fifteen or sixteen larvæ of *Epione apiciaria* refused to feed at all, and about two dozen *Ennomos erosaria* fed up very well for about a fortnight, after hatching from the eggs on May 19th and following days, but died off before pupation. Out of sixteen ova of *Selenia illunaria*, only two reached the imago stage, and out of about fifty ova of *E. fuscantaria* only ten imagines appeared, and these were very small. A fine series of *S. illustraria* from last year's larvæ appeared on March 28th and following days, and I was very successful with *E. autumnaria*, *E. tiliaria*, and *E. angularia*. The former fed up well on lime from April 26th till July 15th, and the resultant imagines began to appear on Aug. 7th. Twenty-six came through, out of thirty-two ova, and all of them are fine insects. The dates for *E. tiliaria* are: larvæ, May 9th; pupæ, July 3rd; imagines, July 15th; but though a good many came through, several of them were rather small, and there was a marked preponderance of males over females. Ten *E. angularia* emerged on June 30th and following days, having pupated on June 10th from larvæ which hatched on April 14th. I don't think I lost a single one of these. A fine lot of larvæ of *Himera pennaria* (twenty-five in number) fed up rapidly and well, and went down on May 3rd; but not a single one pupated, for, much to my disappointment, when I examined them I found that they had all

shrivelled up and died. *Nyssia zonaria* was another complete failure. The majority of the larvæ entirely disappeared, leaving three at first and finally one, which also died after becoming almost full grown. This led me to suspect that they were cannibals. Out of about fifty larvæ of *Amphidasys strataria*, which emerged on May 26th, only eight passed through to the pupa, the first pupa having appeared on July 17th, and I strongly suspect these of cannibalistic propensities also. Some fine black imagines of *A. betularia* var. *doubledayaria* emerged on April 29th and following days. The first few were the blackest, and they gradually got lighter and lighter, though none were of the normal spotted type. A female of *Melanthia ocellata*, obtained by beating on Ranmore, deposited a number of ova on the way home on July 3rd, and the little larvæ appeared on July 5th; but I did not take much trouble about them, and they all died in a few days. I think that, considering the season, my moth-rearing during the year may be described as having been fairly successful.

Altogether, seventy-five species of Heterocera were taken by me this year, including *Lithosia sororcula*, *Pæcilocampa populi*, *Drepana cultraria*, *Plusia chrysitis*, *Acontia luctuosa*, *Phytometra viridaria*, *Euclydia mi*, *E. glyphica*, *Acidalia ornata*, *A. marginepunctata*, *Bapta temerata*, *Aspilates ochrearia*, *Eupithecia oblongata*, *E. assimilata*, *E. pumilata*, *Lobophora viretata*, *Melanippe rivata*, and *Cidaria dotata*. These have been taken either while collecting during the day, or by beating, or by searching the lamp-posts at night; but I am afraid I have been lazy with regard to the collecting of the night-flying moths, having done no sugaring, fallow, or ivy-blossom searching.—F. A. OLDAKER; Parsonage House, Dorking, Nov. 10th, 1902.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—November 19th, 1902.—The Rev. Canon Fowler, M.A., D.Sc., F.L.S., President, in the chair.—Mr. E. M. Cheeseman, of 63, Railway Street, Durban, Natal, was elected a Fellow of the Society.—Dr. Sharp, F.R.S., exhibited the egg-cases made by a beetle of the genus *Aspidomorpha* (*A. puncticosta*), and stated that they had been sent to him by Mr. F. Muir, of Durban, Natal, where the beetle and the egg-cases are common. He said that Mr. Muir had observed the manner in which the case is formed, and hoped shortly to present a paper to the Society describing this, and the anatomical structures involved.—Dr. Norman H. Joy exhibited a well-marked aberration of a female *Lycæna icarus* striped black on the under side in the place of the usual ocellations; an androgynous specimen of the same species; an aberration of a male *Lycæna bellargus*, similarly striped on the under side; a specimen of *Lycæna argiades* taken in 1885 near Bournemouth; and specimens of *Apatura iris* from the neighbourhood of Reading, captured in 1901. Describing the habits of the latter species, he said that with Mr. Lee he took altogether fourteen specimens, all males, eleven of them from the three

top branches on the north side of a beech tree, which appeared to be the throne of the ruling "Emperor" of the wood. Whenever another *iris* came by, the one on the "throne" attacked it, and after a fight in which one would eventually pursue the other out of sight, the conqueror would return to the perch. If this was captured, the next *iris* coming along would take possession of the throne, and so on.—Mr. Claude Morley exhibited the specimen of *Diastictus vulneratus*, Sturm., first recorded in Great Britain in the current number of the 'Entomologists' Monthly Magazine,' and a rare blue form of *Phratora vitellinae*, taken on low herbs, from Tuddenham Fen, Suffolk.—Mr. G. C. Champion exhibited specimens of *Nanophyes durieni*, Lucas, a beetle from Central Spain, with drawings of the larva, pupa, and perfect insect.—Professor E. B. Poulton, F.R.S., stated that Mr. A. H. Church, M.A., of Jesus College, Oxford, had observed the larvæ of a species of *Cucullia* (probably *C. verbasci*) feeding upon *Buddleia globosa*, which was growing against a wall in the Oxford Botanical Gardens. Mr. Church had sent shoots of the same plant to a friend at Warwick, and these, when grown in a similar position in his garden, were all attacked by the same species during the past summer (1902). It is possible that the eggs are laid upon the *Buddleia* because of the very rough general resemblance in certain respects between its leaves and those of *Verbascum*, in the same manner, as the speaker suggested in 1887, that the common food-plants of *Smerinthus ocellata*, viz. apple and willow, may be explained by the parent moth having mistaken the one for the other (Trans. Ent. Soc. Lond. 1887, p. 314). In Section 11 of the memoir cited, it is shown that many young larvæ, on emergence from the egg, are able to feed upon strange species of plants, which later they would refuse if they had become specialized to one of the recognized food-plants.—Mr. H. Goss said that larvæ of *Charocampa elpenor* found on an American balsam near Weybridge had afterwards refused their usual food, *Epilobium hirsutum*; and Mr. R. McLachlan, F.R.S., mentioned the case of *Mamestra persicariae*, a pest in his garden at Lewisham, which as a rule attacked first and most *Anemone japonica*. He had this year offered them fern and elder (which is reputed a favourite food), but the larvæ found upon the anemone refused to touch either of the plants.—Professor Poulton expressed his opinion that unusual food-plants must commonly be begun from the egg, and as an example quoted the case of *Phalera bucephala*, which, found half-grown on hazel, refused to touch elm and *Salix triandra*, there being with this as with other species evidently some sort of gastric association between the larva and its food-plant. He also read a communication from Mr. G. F. Leigh, of Durban, Natal, relating to insect enemies there. The writer referred to the ordinary and very common grey South African rat, as one of the most dreadful pests to breeders of butterflies and moths. They seemed to be fond of almost any pupæ, and thick wooden boxes containing them were eaten right through, and the contents devoured. They especially affected *Charocampa eson* and *C. nerii*. Even more remarkable was the way in which they captured moths on the wing whilst feeding. A rat would leap from the roof right on to the plant, and more often than not the moth selected for attack was captured, usually followed by a fight

amongst the rats over the prize. The moths caught in this way were *Sphinx convolvuli*, *Nephela variegata*, *Charocampa eson*, and *C. celerio*. The first-named is the most successful in escaping, owing to the long proboscis which compels it to hover at some distance from the blossom. *N. variegata* is probably the swiftest flier, but is more conspicuous owing to its dark colour. Bats were also very destructive of South-African insect-life.

December 3rd.—The President in the chair.—Mr. Philip J. Barrand, Bushey Heath, Herts; Mr. William E. Butler, Hayling House, Oxford Road, Reading; and Dr. Malcolm Cameron, R.N., H.M.S. 'Harrier,' Mediterranean Station, were elected Fellows of the Society.—Mr. H. W. Andrews exhibited a male specimen of *Therioptectes luridus*, from Chattenden, July, 1902. Females of this species have been taken at Nethy Bridge, N.B., in 1900, by Colonel Yerbury, but there appears to be no record of the capture of the male. He also exhibited a male *Platychirus sticticus*, and a female *Microdon devius* from Eltham and Shoreham (Kent), respectively, and three small dark examples of *Syrphus balteatus*, taken near Brockenhurst, where the form was not uncommon, in October, 1902.—Mr. M. Burr exhibited two species of *Phyllium* from Ceylon, sent by Mr. Green, *P. bioculatum*, Gray (= *erurifolium*, Hann., and *scythe*, Gray), and *P. athanyus*, Westw.—Mr. A. J. Chitty exhibited a box of insects, taken between Sept. 22nd and Oct. 7th last, from a decayed fence or hedge made of different kinds of wood, with the bark left on. The uprights of the hedge were chiefly of birch. The exhibit comprised about a hundred species, of which seventy-nine or eighty were Coleoptera. Four species of beetles, viz. two species of *Pogonocheros*, the scarce *Microcephalus albinus*, and the extremely rare *Tropideres niveirostris*, mimicked the surroundings of lichen-covered bark, and one, *Acalles tribatus*, resembled buds. Of the rest, there were five species of *Dromius*: *Anisoxya fuscata*, Ill., *Orchesia minor*, *Clinocara tetramera*, Thoms., and *Tetratoma ancora*. A discussion followed, in which the President, Professor E. B. Poulton, and others took part.—Mr. R. Adkin exhibited a hybrid *Selenia bilunaria* × *S. tetralunaria*, together with spring and summer examples of both species for comparison. The hybrid presented some of the markings of each of its parents, the crescentic blotch at the apex of the fore wings, and the band on the hind wings, closely following *tetralunaria*, but no trace of the dark spot usually so distinct on each of the wings of that species, especially in the summer emergence, was visible, while the "second line" of the fore wings closely followed *bilunaria*. In colour it more nearly resembled that of the summer brood of *tetralunaria*.—Mr. G. C. Champion read a paper on *Nanophyes duriensis*.—At a Special General Meeting, held the same evening, the proposed amendments to the bye-laws were considered and adopted by resolution.—H. ROWLAND BROWN. *Hon. Sec.*

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ATTITUDE OF HYBERNATING WASP.

By F. W. FROHAWK, M.B.O.U., F.E.S.



FIG. 1.

FIG. 2.

THE remarkable attitude assumed by wasps during hibernation appears to have escaped the notice of entomologists, at least I am unable to find any reference to it, excepting the following short note in Westwood's 'Introduction,' published sixty-three years ago. In vol. ii. p. 247, allusion is made to the susceptibility of wasps to the cold, where it states: "I have observed a wasp on a frosty morning in October hanging suspended by its jaws to a curtain, with its wings closely folded up between its legs and upon its breast"; excepting the last part of the observation, which should read abdomen instead of breast, it fairly describes a hibernating wasp.

On Dec. 12th last I had occasion to take down a picture from the wall of my bedroom, and noticed on the back, which was of cardboard, a wasp which at first appeared to be wingless, and

sticking to it as if dead. Upon closer examination I was surprised to find its wings neatly folded up passing over the base of its hind legs and then under, with their ends pressing and lying flat on the cardboard, the hind legs stretched out and resting along the side of the abdomen, the latter being curved with the extremity on the cardboard between the apices of the wings; the other two pairs of legs were folded up with the tarsi crossed under the body; the antennæ closely packed away under the neck and covered with a shining substance apparently excreted from its mouth. I was at first unable to account for the way it was attached to the cardboard, but on carefully examining its jaws I found the ends were firmly fixed into the cardboard, which it had previously gnawed, causing a small portion to become jagged, giving it a firmer grip. Upon turning the picture upside down and giving it a list, the body came slightly away from the backing, but it remained rigidly fixed by its jaws. I then placed the picture aside for a few days, and on Dec. 26th I again examined it, and found it had not moved in any way, so made the two accompanying drawings. After making fig. 1, which represents it as described, I had to remove it to make fig. 2, of the ventral surface, to show the position of the wings, legs, and antennæ. In removing it I had to forcibly pull it off the cardboard; in doing so, it tore away with its jaws the small piece they had gripped.

The only movement I have noticed has been a slight pulsation of the abdomen, although it has remained in a box on a mantel-piece above a fire daily burning for a month.

There can be but little doubt that the wings are folded away, and also the legs and antennæ, during hybernation to protect them from injury, which they would be subjected to from the attacks of mice, beetles, &c., if exposed in the normal position of a wasp while resting when not hybernating.

January, 1903.

ON A METHOD OF PRESERVING THE COLOUR OF THE AGRIONINÆ.

BY STANLEY W. KEMP, F.E.S.

ALL collectors of dragonflies must have deplored the way the colour of the small blue and red Agrionidæ disappears on drying. Evisceration which, with care, yields good results in the case of the larger forms, is impossible with these delicate little species. The loss of colour is especially annoying, as the species are, in some cases, distinguished by the markings of the second abdominal segment.

There is, however, a method, which has been tried by Mr. F. W. Terry and myself, which answers remarkably well in most cases, though it has its drawbacks. It will be found useful for the genera *Platynemis*, *Erythromma*, *Pyrrhosoma*, *Ischnura*, *Agrion*, and *Enallagma*.

The process of preparing for the cabinet is of course rendered more tedious, but will, I think, repay the extra trouble expended on it.

The insects should be killed in the usual way by cyanide, &c., and as soon as dead should be pinned on a narrow piece of cork about an inch and a half wide and eight or nine inches long. The legs should be set out, but not the wings; about a dozen specimens can be pinned out on one piece of cork. The cork, with insects, should now be placed in a wide-mouthed jar full of spirit (methylated is quite good enough) and securely stoppered. After about a month they may be taken out and allowed to dry; the spirit on the wings should be absorbed by blotting-paper, as otherwise they are liable to become clouded. The wings may now be relaxed by touching the joints with wood-naphtha on a camel-hair brush, and the insect set. Care should be taken that the *joint itself* is relaxed and the wing not bent above the joint. The legs must be set before the insect is put into the spirit, as it is impossible to relax them afterwards.

By this process the blue colour of the Agrions is very well preserved; if anything, it turns slightly whiter. The colour of the thorax is also good, and *Ischnura elegans* var. *rufescens* turns out splendidly.

This method cannot be recommended for immature specimens, as the body almost invariably curls and buckles on being taken out of the spirit. Another disadvantage is the tendency which the wings have to become a little cloudy; but this cannot be seen when the insects are arranged in a cabinet-drawer against a white background.

80, Oxford Gardens, Notting Hill, W.

[We have examined several specimens of *Agrion mercuriale* and *Enallagma cyathigerum* thus prepared, and, judging from them, it seems certain that anyone who will take the necessary trouble will, by using Mr. Kemp's method, at last be able to become the possessor of well-coloured series of the Agrioninæ. It would appear that the spirit effectually dries the insects, and at the same time prevents decomposition.—W. J. L.]

THE LARVA OF *LIPHYRA BRASSOLIS*, WESTW.

By T. A. CHAPMAN, M.D.

It is necessary to note that an error has occurred in this matter in my short paper in the last volume of the 'Entomologist' (vol. xxxv. p. 225). Mr. Dod writes to the Editor that the larva described as the young larva of *L. brassolis* belongs to another species, and is not that of *brassolis* at all. It matters little to explain how Mr. Dod came to enclose this larva with the *L. brassolis* without knowing he had done so; how Mr. South took it to be the young larva of *L. brassolis*, and handed it to me with the definite statement it was so; or how I detected nothing incongruous in the information. What this larva really is, Mr. Dod does not inform us as yet, beyond that it is that of a moth, and lives with ants.

The larva has a facies that would agree well enough with *Lycæna*, more so, indeed, than the full-grown larva of *L. brassolis* has. It has "macro" prolegs, and is therefore a butterfly, a "macro" or a relative of the Limacodid-Zygæna group; that it is the latter seems most probable.

The curious prolegs of the large larva of *L. brassolis* are, of course, as described, and all that requires altering in what I have said about them that is erroneous, is in seeing their immediate evolution from the form in this moth larva; this may be their evolution, or it may be something very different. It remains true, however, that they present a pseudo-micro form developed from a fully evolved macro-proleg.

For the rest, it will be better to await further facts and materials before saying more, except that I have kept silence for some time, intending to say nothing till these arrived, but have finally concluded that this note is perhaps desirable.

Betula, Reigate: January 2nd, 1903.

ON THE BUTTERFLIES COLLECTED IN EQUATORIAL AFRICA BY CAPTAIN CLEMENT SYKES.

By EMILY MARY SHARPE.

(Continued from p. 8.)

Family PAPILIONIDÆ.

165. *PAPILIO PHORCAS*, Cram.—a, ♂. March from Usoga to Nandi; April, 1900.

166. *P. MEROPE*, Cram.—a, ♂. March from Usoga to Nandi; April, 1900.

167. *P. POLICENES*, Cram.—a, b. March from Usoga to Nandi; April, 1900.

168. *P. PYLADES*, *Fabr.*—*a*, ♂. Lamogi; November, 1899.
 169. *P. MENESTHEUS*, *Drury.*—*a*. March from Usoga to Nandi; April, 1900.
 170. *P. DEMODOCUS*, *Esp.*—*a, b*. Unyoro; March, 1900.
 171. *P. NIREUS*, *Linn.*—*a, b*, ♂. March from Usoga to Nandi; April, 1900.
 172. *P. BRÖNTES*, *Godm.*—*a, b*, ♂. March from Usoga to Nandi; April, 1900.
 173. *P. MACKINNONI*, *E. M. Sharpe.*—*a*. March from Usoga to Nandi; April, 1900.
 174. *P. SIMILIS*, *Cram.*—*a, b*. March from Usoga to Nandi; April, 1900.

Family HESPERIDÆ.

175. *RHOPALOGAMPTA FORESTAN* (*Cram.*).—*a*. Wadelai; January-March, 1900. *b*. Unyoro; March, 1900.
 176. *R. UNICOLOR* (*Mab.*).—*a, b*. Unyoro; March, 1900.
 177. *CAPRONA ADELICA*, *Karsch.*—*a*. Wadelai; January-March, 1900. *b*. March from Usoga to Nandi; April, 1900.
 178. *HESPERIA MACHACOANA* (*Butl.*).—*a, b*. Lamogi; November, 1899.
 179. *KEDESTES FENESTRATUS* (*Butl.*).—*a*. Lamogi; November, 1899.
 180. *K. WALLENGRENII* (*Trimen*).—*a*. Wadelai; January-March, 1900.
 181. *PADRAONA ZENO* (*Trimen*).—*a, b*. March from Usoga to Nandi; April, 1900.
 182. *BAORIS INCONSPICUA* (*Bert.*).—*a*. Lamogi; November, 1899. *b*. Wadelai; January-March, 1900.
 183. *EAGRIS LUCETIA* (*Hewits.*).—*a*. Unyoro; March, 1900.
 184. *SARANGESA ELIMINATA*, *Holl.*—*a*. Unyoro; March, 1900.
 185. *S. MOTEZI* (*Wallgr.*).—*a*. Wadelai; January-March, 1900.
 186. *ERETIS LUGENS* (*Rogenh.*).—*a*. Wadelai; January-March, 1900. *b, c*. March from Usoga to Nandi; April, 1900.
 187. *CELÆNORHINUS GALENUS* (*Fabr.*).—*a*. Unyoro; March, 1900.
 188. *CERATRICHIA FLAVA*, *Hewits.*—*a*. March from Usoga to Nandi; April, 1900.

HETEROCERA.

Family SPHINGIDÆ.

189. *NEPHELE RAFFRAYI* (*Oberth.*).—*a*. Wadelai; January-March, 1900.
 190. *CHÆROCAMPA BALSAMINÆ*, *Walk.*—*a*. Wadelai; January-March, 1900.

191. *C. ESON* (*Cram.*).—*a.* March from Usoga to Nandi; April, 1900.

Family NOCTUIDÆ.

192. *SPHINGOMORPHA MONTEIRONIS*, *Butl.*—*a.* Wadelai; January–March, 1900. *b.* Unyoro; March, 1900.

193. *ACHÆA CATILLA*, *Guen.*—*a.* March from Usoga to Nandi; April, 1900.

194. *PATULA WALKERI*, *Butl.*—*a.* March from Usoga to Nandi; April, 1900.

195. *CYLIGRAMMA RUDILINEA*, *Walk.*—*a.* Unyoro; March, 1900.

196. *ENTOMOGRAMMA PARDUS*, *Guen.*—*a.* Wadelai; January–March, 1900.

197. *E. NIGRICEPS* (*Walk.*).—*a.* Wadelai; January–March, 1900.

198. *LEOCYMA* sp.—*a.* Wadelai; January–March, 1900.

199. *PLECOPTERA* sp.—*a.* Wadelai; January–March, 1900.

200. *BOMOLOCHA ABYSSINIALIS* (*Guen.*).—*a.* March from Usoga to Nandi; April, 1900.

201. *TÆNIOPYGIA SYLVINA* (*Stoll.*).—*a.* Unyoro; March, 1900.

202. *CURUBASA LANCEOLATA* (*Walk.*).—*a, b.* March from Usoga to Nandi; April, 1900.

Family LIMACODIDÆ.

203. *TÆDA PRASINA*, *Butl.*—*a.* March from Usoga to Nandi; April, 1900.

204. *NATADA* sp.—*a.* March from Usoga to Nandi; April, 1900.

Family SABALIADÆ.

205. *SABALIA JACKSONI* (*E. M. Sharpe*).—*a.* March from Usoga to Nandi; April, 1900.

Family ARBELIDÆ.

206. *METARBELA* sp.—*a, b.* Unyoro; March, 1900. *c.* March from Usoga to Nandi; April, 1900.

Family CHRYSOPOLOMIDÆ.

207. *CHRYSOPOLOMA* sp.—*a.* March from Usoga to Nandi; April, 1900.

Family NOTODONTIDÆ.

208. *ZANA SPURCATA* (*Walk.*).—*a.* March from Usoga to Nandi; April, 1900.

Family HYPSIDÆ.

209. *ARGINA ASTREA* (*Drury*).—*a.* March from Usoga to Nandi; April, 1900.

Family LYMANTRIADÆ.

210. OLAPA FLABELLARIA (*Fabr.*).—*a.* March from Usoga to Nandi; April, 1900.

211. CROPERA ADSPERSA, *Herr.-Sch.*.—*a.* March from Usoga to Nandi; April, 1900.

Family ZYGENIDÆ.

212. ARNIOCERA sp.—*a, b.* March from Usoga to Nandi; April, 1900.

Family ARCTIADÆ.

213. DIACRISIA ? RHODESIANA, *Hampson*, Cat. Lepid. Phalænæ, vol. iii. p. 296, pl. xlv. fig. 24, 1901.—*a.* March from Usoga to Nandi; April, 1900.

214. D. CURVILINEA (*Walk.*), *Hampson*, t. c. p. 275.—*a.* March from Usoga to Nandi; April, 1900.

215. D. MACULOSA (*Stoll.*), *Hampson*, t. c. p. 276.—*a.* Unyoro; March, 1900.

216. D. ? FLAVICOSTA (*Hampson*), t. c. p. 322, pl. xlvi. fig. 21.—*a, b.* March from Usoga to Nandi; April, 1900.

217. SECUSIO STRIGATA, *Walk.*, *Hampson*, t. c. p. 491, fig. 219.—*a.* March from Usoga to Nandi; April, 1900.

Family LITHOSIIDÆ.

218. UTETHEISA PULCHELLA (*Linn.*).—*a.* Wadelai; January–March, 1900.

Family AGARISTIDÆ.

219. XANTHOSPILOPTERYX POGGEI (*Dewitz*), *Hampson*, t. c. p. 562.—*a, b.* March from Usoga to Nandi; April, 1900.

These specimens do not quite agree with the typical form of *X. poggei*, the transverse band on the primaries being almost obsolete.

220. X. HORNEMANNI (*Druce*), *Hampson*, t. c. p. 572.—*a.* March from Usoga to Nandi; April, 1900.

221. X. MONS-LUNENSIS, *Hamps.*, t. c. p. 570, pl. liii. fig. 10.—*a.* March from Usoga to Nandi; April, 1900.

222. ROTHIA BUTLERI (*Walk.*), *Hampson*, t. c. p. 576, pl. liii. fig. 13.—*a.* March from Usoga to Nandi; April, 1900.

223. ÆGOCERA RECTILINEA, *Boisd.*, *Hampson*, t. c. p. 596.—*a, b.* Wadelai; January–March, 1900. *c, d.* Unyoro; March, 1900.

Family GEOMETRIDÆ.

224. ALCIS ACACIARIA, *Boisd.*.—*a.* March from Usoga to Nandi; April, 1900.

225. GONODELA MACULOSA, *Warr.*.—*a, b.* March from Usoga to Nandi; April, 1900.

NEUROPTERA.

Family MYRMELEONIDÆ.

226. *PALPARES* sp.—*a, b.* March from Usoga to Nandi; April, 1900.

ORTHOPTERA.

Family CIGADIDÆ.

227. *PLATYPLEURA CONFUSA*, *Karsch.*—*a.* March from Usoga to Nandi; April, 1900.

NEW SPECIES OF INDIAN CHRYSIDIDÆ.

By MAJOR C. G. NURSE, Indian Staff Corps.

(Continued from p. 12.)

CHRYSIS AUTOCRATA, n. sp.

♀. Stoutly built; frontal cavity finely, head and thorax somewhat irregularly, the latter coarsely punctured, abdomen, especially 2nd and 3rd segments, more regularly and finely punctured; pronotum distinctly narrower at base than at apex, its shoulders slightly rounded, and having a median longitudinal impressed line at base; 2nd and 3rd abdominal segments distinctly carinated, 3rd segment without subapical foveæ, quadridentate, the inner teeth close together and blunt, the outer teeth smaller, sharper, and not projecting nearly so far back as the inner ones. Head, thorax, and 1st abdominal segment metallic green with blue reflections; 2nd and 3rd segments lighter green, with a golden or coppery effulgence; antennæ piceous; tarsi rufo-testaceous; wings hyaline, nervures and tegulæ brownish testaceous; head, sides of thorax and abdomen, and legs with some sparse rather long pubescence. Long. 8.5 mm.

Hab. Quetta; two specimens.

CHRYSIS HOGGEI, n. sp.

♂. Head, thorax, and abdomen of equal width, closely, regularly, and deeply punctured, the 2nd and 3rd abdominal segments more finely so than the rest of the body; an impressed median longitudinal line on pronotum, not reaching its apex; apical abdominal segment quadridentate, the teeth blunt, with a row of subapical foveæ. Dark metallic bluish green, the scutellum sometimes green with a slight golden effulgence; flagellum of antennæ dark rufous; all the tarsi pale testaceous at base, becoming slightly darker at apex; pubescence white, short, and sparse, except on the front, where it is longer and thicker; wings hyaline, nervures black, tegulæ dark blue. Some specimens are almost entirely dark blue, without any green shade. Long. 6-7 mm.

Hab. Quetta; a few specimens.

I have named this species after Lieut.-Col. Hogge of my regiment, as he sent me the first specimen I obtained.

CHRYSIS THALIA, n. sp.

♂ ♀. Slenderly built, of equal width throughout; head, thorax, and abdomen closely, regularly, and somewhat finely punctured; front concave, very finely rugose; pronotum with its "shoulders" rather sharply angled, and with a median longitudinal indentation at base; 2nd and 3rd abdominal segments with a trace of a carina; apical segment quadridentate, the teeth sharp, with a row of deep subapical foveæ. Dark blue, with green and sometimes purple reflections, the latter especially at the apex of the 2nd abdominal segment; flagellum of the antennæ, and tarsi piceous, the anterior and posterior tarsi sometimes inclining to testaceous; pubescence greyish and sparse; white, thicker, and longer on the front; wings clear hyaline, nervures dark testaceous, tegulæ dark blue, finely punctured. Long. 6-7 mm.

Hab. Quetta.

This species appears to be near to *C. seraxensis*, Rad., but is slightly larger, is cylindrical in shape, and the tarsi are usually piceous and not rufous.

CHRYSIS QUETTAENSIS, n. sp.

♀. Of equal width throughout; head and thorax closely but not very finely, abdomen more finely and regularly punctured; front concave, very finely punctured or rugose; head and pronotum subequal, the latter wider at apex than at base, with a median longitudinal indentation at base; 2nd abdominal segment with a trace of a carina, 3rd segment quadridentate, the teeth moderately sharp, with deep subapical foveæ. Head and thorax metallic green, the central quadrate division of the mesonotum, and the sides of the thorax with more or less blue reflections; abdomen lighter green, with golden and coppery reflections, especially on the 2nd and 3rd abdominal segments; apex of 3rd segment deep blue; legs greenish blue; flagellum of antennæ and tarsi reddish black; wings hyaline, nervures very dark testaceous, almost black, tegulæ dark blue. Long. 6-8 mm.

Hab. Quetta; common.

CHRYSIS BALUCHA. n. sp.

♂. Of equal width throughout; head, thorax, and abdomen closely, but not very finely punctured; front concave, the sculpturing hidden by the pubescence; head and pronotum subequal, the latter with the "shoulders" rather sharply angled, and with a median longitudinal indentation at base; 2nd segment with a trace of a carina; 3rd segment quadridentate, the teeth rather sharp, and with deep subapical foveæ. Dark blue, with greenish reflections; flagellum of antennæ and tarsi light rufo-testaceous; wings clear hyaline, nervures dark testaceous, tegulæ dark blue. Long. 6-8 mm.

Hab. Quetta; common.

I believe this species to be the male of *C. quettaensis* above, but I have no evidence other than that both are very common at Quetta, are much the same size, and that I obtained only males of one and females of the other. I think, therefore, that it is better to keep them apart until better evidence of their affinity is obtained.

CHRYISIS ARRESTANS, n. sp.

♀. Head and thorax coarsely, abdomen finely punctured; head and thorax very slightly narrower than abdomen; clypeus emarginate anteriorly; a well-defined sinuate transverse ridge below anterior ocellus, and the front below it concave, with sparse white pubescence, under which is finely punctured; head, viewed from above, nearly twice the size of pronotum, the latter with a median longitudinal depression; 1st abdominal segment almost impunctate in the centre, 2nd segment with a median longitudinal carina, 3rd segment sex-dentate, the teeth sharp, and with a subapical row of foveæ. Dark blue-green, with a purple tint in some lights; the clypeus, mandibles at base, and scape of the antennæ bright metallic green; mandibles black in the centre, red at apex; 2nd abdominal segment green at apex; antennæ and tarsi dark red, almost black; wings hyaline, tegulæ purple, radial cell not quite closed. Long. 6 mm.

Hab. Deesa; a single specimen.

CHRYISIS ORIENTALIS (Guér.).

This species, which is common at Deesa, varies very much both in colour and size. M. du Buysson says, in the Journal of the Bombay Natural History Society, vol. x., p. 477, that "le 2^e segment abdominal porte de chaque côté, à sa base, une petite tache bleu-foncé." This is by no means invariably the case, and quite half my specimens are without this spot. In length this species varies from 6.5 to 13 mm., and in expanse from 13 to 24 mm.

ON THE MORPHOLOGY AND CLASSIFICATION OF THE
AUCHENORRHYNCHOUS HOMOPTERA.

By DR. H. J. HANSEN.

(Continued from vol. xxxv. p. 263.)

OF the division of the Auchenorrhyncha into these four families, which was proposed by Stål with a subtle systematic insight, but which, as a matter of fact, not a single subsequent author has accepted, I have now drawn up the numerous exclusive characters—brought forward in this conspectus—so that its prevalency may be considered as in some degree proved, and it ought perhaps to result that in future not many systematists will arbitrarily erect new families on a basis of a somewhat peculiar habitus. It is also my conviction that even in view of the possibility of one or other of these characters not proving so exclusive as I have thought, in researches upon a considerable exotic material, an extended study of the structure of these insects will give so many new characters for the same families, that the loss will be more than compensated for, consequent, of course, upon the supposition that real links, unknown

to me and so far undescribed, are not discovered. I may, for example, mention that in the Cercopidæ, but not in the three other families, the larvæ have the abdominal pleural parts very divergent from the adults; in the same way the antennæ in the Cercopidæ undergo a noteworthy change of structure, described above, by which last-mentioned circumstance this family is distinguished from the other Auchenorrhyncha. That the larvæ of Stridulantia possess remarkably powerful anterior legs, adapted for digging, is well known; that, on the other hand, the structure of their claws is totally different from that of the imagines is a very peculiar fact not widely esteemed. For the lack of adequate material I must, meanwhile at least, refrain from dealing further with metamorphosis in the different families, and be content with this intimation of its use for systematics.

V.

The principal difficulty still remains to be dealt with, *viz.* a division into sharply characterized groups of these families, of which the Jassidæ and Fulgoridæ have been so notably endowed by nature with genera and species. Just so easy as division and characterization of these families have appeared to me, just so difficult did it appear to effect a dismemberment of the Jassidæ, and particularly of the Fulgoridæ, and that in spite of the fact that surely not within a single family of insects are there found such strong differences in habitus, in the form of the head and prothorax, and in the structure of the wings, as actually in these two. The material of the Copenhagen Museum, and that of it that I could dissect for microscopical researches, was, particularly in the Fulgoridæ, too meagre for sharp circumscription of groups. I will now set forth my opinions, with constant reference to Stål's above-mentioned (on p. 28)* proposals in 'Hemiptera Africana.'

1. *Stridulantia*.—It appears to me very probable that this family is susceptible of division into good groups. Stål has scarcely essayed this. The division into two groups, based upon the flight-organs, by Amyot and Serville, is perhaps a practical help in identification; but it is seen to be without scientific value, as in the first little group there are placed such extremely diverse genera as *Polyneura*, Westw., and *Cystosoma*, Westw. (as well as the certainly highly interesting *Hemidictya*, Burm., unknown to me), separated from forms with which they have far stronger relationship than mutually with one another.†

2. *Cercopidæ*.—Stål's groups in the 'Hemiptera Africana'

* Not translated.—G. W. K.

† Dr. Hansen wishes me to say that at the time of writing these, he was not aware of the existence of Distant's 'Monograph of Oriental Cicadidæ,' 1889-92 (a work scarcely to be found in Denmark), where this family is divided into two primary groups, based upon the covered or uncovered (speaking generally) condition of the tympana (p. 3).—G. W. K.

appear satisfactory. I cannot make fresh contributions to their establishment.

3. *Jassidæ*.—Stål has the merit of having, in 1866, brought together again the Membracidæ and the typical Jassidæ into one family. This he divides into seven groups, of which the first six together practically agree with the family Membracidæ founded by Burmeister. The principal qualities, good and bad, of this division will be discussed now.

Amyot and Serville employed as distinguishing features between their *Conidorsi* and *Planidorsi* the prolongation of the prothorax backwards over the abdomen, or the absence of this circumstance. This character appears—especially after a genus like *Tolania*, Stål, is discovered—absolutely useless, for this form, which is throughout akin to *Centrotus*, must be referred, according to Amyot and Serville, to the *Planidorsi*. This Stål has perceived, and he employs in the ‘Hemiptera Africana,’ for the separation of five of the first groups from the “Jassida,” other characters as well, among which that which is based on the form of the lateral margins of the head (dilated or not) is the best.

(To be continued.)

MISCELLANEA RHYNCHOTALIA.—No. 6.

By G. W. KIRKALDY, F.E.S.

ONYCHOTRECHUS, gen. nov.

CLOSELY allied to *Gerris*, subgenus *Limnogonus*, Stål, and intermediate between the latter and *Eotrechus*, Kirkaldy. It differs from the former by the long posterior claws, and from the latter by the claws being somewhat post-apical and inserted in a cleft in the tarsi. Type, *O. rhexenor*, Kirkaldy.

General appearance of *Limnogonus*, but duller and more pubescent. Rostrum reaching to about middle of mesosternum. Antennæ a little shorter than length of body; first segment shorter than any two others together. The intermediate and posterior legs each more than twice as long as body. Second segment of anterior tarsi three times as long as first.

O. RHEXENOR, sp. nov.

Dull blackish grey with sparse pale yellow pubescence; a median longitudinal stripe on vertex continued on to anterior lobe of pronotum, a lateral line on each side of vertex (anterior to the eyes), two lateral lines on each side on the anterior lobe of pronotum, lateral margins of sterna—pale flavous with a pink tinge; lateral margins of posterior lobe of pronotum greyish white. Elytra pale fuscous. Antennæ dark fuscous, first segment paler beneath basally; legs more or less dark fuscous, paler beneath. Head beneath and prosterna (except laterally),

ambulacra, genital segment, testaceous; rest of ventral surface blackish grey. Antennæ: first segment twice as long as head, one-third longer than second, which is one-half longer than third, fourth one-fourth longer than third. Posterior lobe of pronotum superficially carinate longitudinally, subrectiform, rounded posteriorly. Anterior femora scarcely incrassate; intermediate femora three-sevenths longer than tibiæ, which are somewhat more than five times as long as the subcylindrical tarsi. Second tarsal segment about two and a half times as long as first, and about twice as long as claw. Posterior legs of similar proportions. Elytra reaching beyond apex of abdomen.

♂. Abdomen beneath: fourth to seventh segments laterally somewhat compressed, medio-longitudinally sulcate. Apical margin of seventh segment roundly but not profoundly emarginate; eighth a little longer medianly than seventh; ninth about equal to eighth. Long. excl. elytr. 5.8 mill.; lat. max. 1.7 mill.

Hab. South India; Kanara.

I have seen a single male of this interesting form, kindly communicated to me for examination by Mr. Distant.

FIVE NEW COCCIDÆ FROM MEXICO.

By T. D. A. COCKERELL.

MYTILASPIS MIMOSARUM, n. sp.

♀. Scale 2 to 3 mm. long, brownish white, narrow, convex, usually curved; exuviae orange-brown. ♂ scale as usual. Compared with the next species (*M. townsendiana*) the scales are larger, and not so pure white.

♀. Adult. Colour (after boiling in KHO) greenish or pale orange, the anterior end sometimes slightly pinkish. Five groups of circum-genital glands; median of 9, anterior laterals 16 to 18, posterior laterals 9 to 10. Only one pair of distinct lobes, these large and brownish, rounded, slightly crenulated or entire, separated by an interval in which are two pointed squames. A pair of pyriform glands at the base of each median lobe, but quite at the lateral margins, though the outer one is curved inwards; second lobe represented by two colourless minute lobules, the inner one the larger; after this come a spine and a pair of large spine-like squames; then two broad and very low eminences representing the third lobe, the second usually minutely crenulate; then a spine and two very large spine-like squames; then after a considerable interval two or three more spine-like squames, and three such on the lateral margins of each of the next three segments. None of the segments have their lateral margins noticeably produced. Submarginal transverse glands as usual; dorsal glands as usual, not especially numerous. Anal orifice about opposite the median group of circumgenital glands, and 138μ distant from tips of median lobes. Skin minutely striated throughout. Length of the longest squames, 24μ .

♀. Second stage. Colour (after boiling) pale yellowish brown; one pair of large low lobes; large squames.

Larva.—Rather elongate; colour (after boiling) pale greenish, with usually a large brown spot in the region of the mouth; eyes blue; spines large; the two caudal lobes look like long-fanged incisor teeth, but only project above the margin as two very minute nodules.

Hab. Zapotlan, Mexico; crowded on small branches of *Mimosa* sp., July 6th (C. H. T. Townsend).

MYTILASPIS TOWNSENDIANA, n. sp.

♀. Scale 2 mm. long, convex, narrow, often curved; white, with orange-brown exuviae. ♂ scale as usual.

♀. Adult. Colour (after boiling in KHO) pale yellowish green; the two segments anterior to the terminal portion much produced at the sides, into rounded lobes directed backwards, these lobes having many round glands. No circumgenital glands, but numerous round dorsal glands, much as in *M. ulmi*; a curved band of these glands on each side of the anal orifice, simulating a continuous band of circumgenital glands, but differing by the glands being smaller and not so close together, irregularly placed. Transverse submarginal glands of the usual type. Small pyriform marginal glands of the usual type; two under each median lobe; two under the first (larger) portion of second lobe, the first of these small; two very small ones under the small portion of second lobe; a large one under each half of third lobe; four others under projections of the margin beyond. Spines rather large; squames not large. Lobes striated; median lobes not far apart, large, rounded, and entire; second lobes divided into a large inner and small outer lobule, the inner minutely crenulate on its outer slope; third and fourth lobes each represented by a couple of low crenulated processes, those of the fourth much broadest; one or two pointed processes on the margin beyond. The margin beyond the third lobe might be said to be irregularly serrate. Antennae with two bristles. Anal orifice to tips of median lobes about $114\ \mu$; breadth of median lobes about $12\ \mu$.

♀. Second stage. Colour (after boiling) pink. Lobes formed as in adult, but second lobe is low and entire.

Larva.—With two large low lobes, widely separated. Femora swollen.

Hab. Colima, Mexico; abundant on small branches of "garabatlillo," July 13th (C. H. T. Townsend). Easily separated from *M. alba* by the narrower scale and entire median lobes.

NEOLECANIUM LEUCÆNÆ, n. sp.

♀. Large and very convex, but not constricted at base; long. 10, lat. $6\frac{1}{2}$, alt. 6 mm., varying to long. $8\frac{1}{2}$, lat. 7, alt. $6\frac{1}{2}$ mm., rather dark ferruginous, not very shiny, not tuberculate, more or less covered with small patches of dull white waxy secretion; sides pitted. Legs and antennae absent. Skin (after boiling) orange-ferruginous, with numerous round or oval gland-pits, mostly rather large, but in places the skin shows only very minute glands. Skin mottled with brown in a more or less radiate manner. Anal plates surrounded by a hyaline area; the plates triangular, with rounded corners, the anterior lateral

side much longer than the posterior lateral. Mouth-parts small. Measurements in μ :—Diameter of larger dermal glands, 15 to 33; anal plate, long. 210, lat. 126.

Larva.—Quite ordinary; oval; stigmatal spines in threes, one large and two small; marginal bristles few, simple; last joint of antenna 36 μ long.

Hab. Zapotlan, on *Leucæna* sp., July 7th (C. H. T. Townsend). It is preyed upon by some lepidopterous larva. *N. leucænæ* is closely allied to *N. chilopsidis*, but the scale is not so dark, and the skin is different, the larger glands being larger, and not occupying the same area as the minute ones.

AKERMES COLIMÆ, n. sp.

♀. Scale about 5 mm. long, ferruginous or coffee-colour, with a partial covering of a sort of snuff-coloured tomentum, which also covers the inside of the gall. They are shrunken, but appear to have been nearly globular. Anal plates small and corrugated, surrounded by a dark thickened area. The surface of the scale when seen with a lens appears dullish ferruginous, minutely marbled and spotted with black. No sign of any waxy or glassy secretion.

Boiled in KHO, they scarcely colour the liquid; but upon being placed in very dilute KHO an abundance of a dark madder-red pigment is given into solution; in strong KHO this pigment becomes lilac, and more or less of a blue flocculent precipitate appears. Nitric acid does not restore the madder-red colour. The insect remains brown after prolonged boiling. The skin is distinctly tessellated in places, the tesserae being about 12 μ diameter. Marginal spines small and tapering (about 18 μ long), not numerous, placed in an undulating row. Some round gland-pits, about 27 μ diameter. At least two transverse bands of spines, these spines numerous and crowded, some as long as 42 μ ; connected with these bands are patches (about 175 μ diam.) of very distinct round glands (about 6 μ diam.), placed at varying distances apart. Where the spine-bands reach the lateral margins (apparently in the region of the stigmata), some of the spines are very long and branched at the end. No legs or antennæ found. Tracheal tubes large, 30 to 90 μ diameter.

Hab. Cualata, Colima, July 28th; in large hollow pyriform twig-galls (about 18 mm. diam.) on a tree 12 to 20 ft. high (C. H. T. Townsend). The galls are certainly not made by Coccids; they are inhabited by ants, but may be lepidopterous or coleopterous in origin. *A. colimæ* is a remarkable species; it is to be regretted that the larva is unknown.

PSEUDOCOCCUS [DACTYLOPIUS auctt.] CUALATENSIS, n. sp.

♀. Length about 2 mm., entirely covered dorsally with dense white secretion, very much as in *P. pseudonipæ* (Ckll.); on boiling, does not stain liquid; after boiling, colour very pale pinkish, legs and antennæ light brown. Labium about 150 μ long and 84 broad. Skin with the usual round glands, and rather numerous minute hairs; bristles of anal ring about 75 μ , caudal bristles about 120. Legs

rather stout and short, with large claws; tibia and tarsus with numerous bristles; digitules filiform, with minute knobs. Antennæ 8-jointed.

Measurements of legs and antennæ in μ :—

Anterior leg; length of femur + trochanter 198, of tibia 90, of tarsus 51.
Hind leg; " " " 225, " 120, " 51.
Anterior leg; width of femur 69, of tibia 42.
Length of antennal joints: (1.) 39-48, (2.) 36, (3.) 28-30, (4.) 15-18,
(5.) 18-27, (6.) 21-24, (7.) 30-33, (8.) 57-60.

Larva.—In ♀, about 530 μ long, with legs and antennæ well developed; shape ordinary; antennæ 6-jointed, joints measuring in μ : (1.) 24, (2.) 30, (3.) 18, (4.) 16, (5.) 16, (6.) 51.

Hab. Cualata, Colima, July 28th (C. H. T. Townsend). Quite numerous in the same galls as *Akermes colimæ*. *P. cualatensis* differs from *P. pseudonipæ* in its legs and antennæ; it also differs from *P. nipæ* (Maskell), especially by the short and stout legs. The antennæ seem invariably 8-jointed, and are rather after the manner of *P. neomexicanus* (Tinsley).

Note on the ant associated with Coccidæ at Cualata.

Some of the ants found at Cualata in the galls with *Akermes colimæ* and *Pseudococcus cualatensis* were referred to Professor W. M. Wheeler, of the University of Texas, who kindly reports as follows:—

"The ant is *Azteca longiceps*. Emery. It agrees perfectly with Emery's figure and brief description of a single dealated queen from Alajuela, Costa Rica. These ants of the genus *Azteca* live regularly in the modified stems of tropical trees in what is usually regarded as a case of typical symbiosis. The trees inhabited are mainly of the genus *Cecropia*, and I suspect that the cases observed by Prof. Townsend belong to this group of plants. Emery, in his monograph of the genus *Azteca*, also mentions the occurrence of *A. depilis* in vesicles on the leaves of *Tococa coronata*, Benth. Fritz Mueller, Belt, and Emery all record the occurrence of Coccids with species of *Azteca*, but they do not appear to have described the species. You would undoubtedly find much material on this subject in Schimper's 'Die Wechselbeziehungen zwischen Pflanzen und Ameisen im tropischen Amerika'" (litt., Oct. 26th, 1902).

It may be added that in Trinidad *Palæococcus rosæ* and *Coccus nanus* are found in the runs of *Azteca chartifex*, Forel. *Coccus nanus* is the same as *Lecanium nanum*, Ckll., 1896.

T. D. A. C.

East Las Vegas, New Mexico, U.S.A.:
Oct. 30th, 1902.

NOTES AND OBSERVATIONS.

ABERRATION OF *ENALLAGMA CYATHIGERUM*.—As Mr. Lucas was looking at some of my specimens of *E. cyathigerum*, he noticed that the black pterostigma was absent from the left hind wing of a male that was taken in the New Forest in August last. Examination with a lens shewed that the neurulation at the tip of the same wing was also aberrant. Though the pterostigma is so small, its absence from the wing is very striking. Dr. Chapman suggests that the cause must be sought for in an injury received during one of the earlier instars.—S. W. KEMP; Notting Hill, January, 1903.

HILARA VIRIDIS.—A number of years ago I found a new fly in Jamaica, which Mr. Coquillett in 1895 described as *Hilara viridis*. The insect was quite out of the known range of *Hilara*, and the green colour was peculiar, but there was no other genus to receive it. Upon receiving recently Mr. A. L. Melander's excellent monograph of the North American Empididæ, I became convinced that the fly belonged to the Mexican and West Indian genus *Lampremis*, Wheeler and Melander, 1901. I accordingly wrote Mr. Melander, who kindly gave me an example of *Lampremis*, which I communicated to Mr. Coquillett, who now assures me that my opinion is correct. The species will therefore be *Lampremis viridis* (Coq.)—T. D. A. COCKERELL.

CAPTURES AND FIELD REPORTS.

PSOCIDIA AT MISSENDEN, BUCKS.—On Sept. 12th I had a day's collecting at King's Hill, near Great Missenden, Bucks. By beating in a small wood, which consisted mostly of conifers with a little oak and ash, I obtained seven species of Psocidia. Of these, the most striking and at the same time the most abundant species was *Cacilius fuscopterus*, Latreille. *C. flavidus*, Stephens, was common, while a few *C. obsoletus*, Steph., were met with. A single *Psocus longicornis*, F., was beaten from oak, and other species were *Stenopsocus cruciatus*, Linné, *Peripsocus phæopterus*, Stephens, *Elipsocus flaviceps*, Steph.—STANLEY V. KEMP, F.E.S.; 80, Oxford Gardens, Notting Hill, W.

THE DRAGONFLIES OF EPPING FOREST.—After a prolonged period of cold winds and cold rains, which greatly retarded the appearance of dragonflies and restricted their number, towards the end of May the weather became warm and bright. On the 25th of that month we made our first capture, a solitary male of *Pyrhosoma nymphula*. This event was followed on 1st June by a female *Leptetrum quadrimaculatum* being taken at rest; the right hind wing was much aborted. On the same morning we took immature specimens of *Agrion puella*, of both sexes; we observed pairs in cop. on 22nd June. *Ischnura elegans*, *Anax imperator*, and *Libellula depressa* were all taken for the first time on 26th June, and several empty nymph-cases of *A. imperator* were also found on the same occasion. On 9th July we took, at Walthamstow, a solitary specimen (female) of *Enallagma cyathigerum*; we had considered

this species, at one time tolerably plentiful, to be locally extinct, for our last recorded capture in the Epping Forest district was made as long ago as 10th July, 1887. *Sympetrum striolatum* was especially late in appearing, for we did not take that species until 3rd August. *S. sanguineum*, usually a common insect in the forest, was not met with at all. *Æschna cyanea* was first taken on 9th August, but, although we saw *Æ. grandis* on one or two occasions, we failed to secure any specimens. We kept under observation that most elusive of insects, *Æ. mixta*, from the second week in September to 5th October, but, despite our having devoted several entire mornings to its pursuit, it was not until the day named that we made a capture; the specimen taken was a female. The following are the latest dates upon which we took the species mentioned:—*P. nymphula*, 13th July; *I. elegans*, 13th July; *A. puella*, 3rd August; *Æ. cyanea*, 8th September; *S. striolatum*, 19th October.—FREDERICK WILLIAM CAMPION, HERBERT CAMPION.

ODONATA IN NORFOLK.—I was in the Norfolk Broads June 25th to 31st, and spent a couple of mornings at dragonflies. *Orthetrum cancellatum* was fairly common, both sexes, and I managed to get a few. *Libellula fulva* was also about, and I took nine—five males and four females. I had to let most of the *O. cancellatum* go, as I had only a muslin sleeve for dragonflies. I had not gone out prepared for such large game, as we were working in the reed-beds, and only when we were not getting much in the lepidopterous line did I look about for other things. I caught one or two *Æschna grandis*. On July 29th I went down again, and when cutting reeds for pupæ of *Nonagria canna*, I saw what I believe was *Æ. isosceles*. It settled quite close to me, and I could make out the markings quite plainly, I had no net with me, so I tried to grab it, but failed, and it disappeared. I should not like to record it definitely, as I did not actually take it, but I am almost certain it was the right thing. It was rather late for it, but then the season was all out of gear, at any rate amongst Lepidoptera.—H. M. EDELSTEN; Enfield, Middlesex, Dec. 17th, 1902.

LEPIDOPTERA AT LIGHT, &c., IN HERTS, 1902.—In accordance with my annual practice I append notes on the Lepidoptera I have met with in this county during the year. As a whole the season has not come up to the average of the last few years. As before, my light-trap was responsible for the best captures, and the following were new to my list for this particular locality:—

Smerinthus populi, *Notodonta dictæoides* (one), *Noctua brunnea*, *Cleoceris viminalis*, *Cucullia umbratica*, *Ellopiæ prosapiaria* (*fasciaria*), *Eurymene dolabraria* (two), *Selenia illustraria* var. *æstiva*, *Pseudoterpnæ pruinata* (*cytisaria*), *Asthena luteata*, *Acidalia dilutaria* (*osseata*), *Macaria liturata*, *Emmelesia alchemillata*, *Eupithecia castigata*, *E. assimilata*, *E. sobrinata*, *Aglossa pinguinalis*, *Scoparia mercurella* (*frequentella*), *Crambus geniculeus*, *Phycita roborella* (*spissicella*), *Salebria betulæ*, *S. formosa* (four), *Hypochalcia ahenella* (one), *Eurhodope advenella* (four), *Euzophora pinguis*, *Ephestia elutella*, *Tortrix unifasciata*, *Dictyopteryx læflingiana*, *D. bergmanniana*, *Penthina cynosbana*, *Spilonota ocellana*, *S. rosæcolana*, *Sericoris urticana*, *Carpocapsa splendidana*, *Yponomeuta vigintipunctatus*, *Y. cagnagellus* (*cognatella*), *Phibalocera quercana*, *Depressaria flavella* (*liturella*), *Æcophora pseudospretella*.

Of those which had occurred here before, the following may be mentioned:—

Gastropacha (Lasiocampa) quercifolia, *Drepana falcula*, *D. binaria* (*hamula*), *Pterostoma palpina*, *Axylia putris*, *Xylophasia lithoxylea* (one; this species has been scarce for some years), *Dipterygia pinastri* (*scabriuscula*), *Neuronia popularis*, *Cerigo matura*, *Luperina cespitis*, *Miana fasciuncula*, *M. bicoloria* (*furuncula*), *Petilampa (M.) arcuosa*, *Agrotis puta*, *A. porphyrea* (*strigula*), *Noctua triangulum*, *Calymnia pyralina*, *C. diffinis*, *Hadena thalassina*, *Plusia moneta* (fairly common), *Selenia lunaria*, *Ennomos erosaria*, *Acidalia imitaria*, *Timandra amataria*, *Eupithecia subfulvata*, *E. pulchellata*, *E. subnotata*, *Cidaria pyraliata*, *C. associata*, *Pelurga comitata*, *Eubolia plumbaria*, *Herminia tarsipennalis*, *H. grisealis*, *Pyralis farinalis*, *Crambus hortuellus*, *Aphonia sociella*, *Tortrix heparana*, *T. fosterana* (*adjunctana*), *Peronea variegana*, *Penthina betulatana*, *P. ochroleucana*, *Xanthosetia zoegana*, and *X. hamana*.

I tried sugaring in August and September both at Bushey Heath and Bricket Wood, but it was slow work, captures being few and far between. The following, among others, were taken:—*Asphalia diluta* (common), *Agrotis suffusa* (both sexes fairly common), *Noctua plecta*, *Triphæna fimbria*, *Amphipyra pyramidea*, *Mania maura*, *Xanthia citrargo*, *Polia flavicincta*, *Hadena protea*, *Catocala nupta*, and *Hypæna rostralis*.

At the end of June I had a day's collecting in the north-west part of the county, in the chalk district. *Lycæna bellargus* (*adonis*) males were fairly plentiful, but only one female fell to my lot. I also took *L. alsus* (*minima*) and *Carpocapsa grossana*, the latter beaten out of beech.

I was pleased to find *Hesperia thaumas* (*linea*) at the same locality in August, but only in limited numbers. (Although this is generally considered to be a common "skipper," I have never seen it in abundance anywhere round here). I was rather too early for *Hesperia comma* and only saw two males, but *Lycæna corydon* swarmed as usual. *Eubolia limitata* (*mensuaria*) and *E. bipunctaria* were also taken.

I am indebted to Mr. Richard South, and also to Mr. C. G. Barrett, for having named for me some of the more obscure species mentioned above.—PHILIP J. BARRAUD; Bushey Heath, Herts.

AUTUMN NOTES FROM THE SALISBURY DISTRICT. — I have been in Salisbury since about the middle of September, and my notes are from September 18th to December. With the exception of one or two evenings at the street-lamps, very little serious collecting has been done; but the results, I venture to think, on the whole, are satisfactory, and I eagerly await the summer of 1903 for working the district. To start with the butterflies: *Gonepteryx rhamni* was common, and was seen up to the 25th October. *Pieris brassicae* and *P. napi* were both about in September, the last I saw of the former being on October 12th. *Vanessa urticae* was common enough, and was seen as late as the beginning of November. *V. atalanta* was also seen up to October 16th. Other butterflies noticed were *Epinephele ianira*, *Cænonympha pamphilus*, *Chrysophanus phlæas*, and *Lycæna icarus*, an apparently quite fresh example of *C. phlæas* being seen October 8th.

On September 26th I cycled over to Lyndhurst, and spent a very short time in the New Forest, where I found *Dryas (Argynnis) paphia*

and *Satyrus semele* still out, and also saw *Vanessa io*. Three species of dragonflies were noticed:—*Sympetrum striolatum*, *S. scoticum*, and *Æschna* (? *cyanea*), the first-named species also being seen at Salisbury. I also came across three or four dead grass-snakes, from one of which I obtained a specimen of the beetle *Silpha littoralis*.

To return to Salisbury and moths. Treacle was tried in the garden on several occasions, but it was a failure, *Anchocelis pistacina*, *Xanthia ferruginea*, and *Cerastis vaccinii* being the only moths attracted. The ivy in the garden was equally unattractive, *Orthosia lota* being the only addition. The street-lamps, however, were very productive, moths being plentiful on them both by day and night. Species taken at light:—*Pacilocampa populi* (a few males), *Petasia cassinea* (three), *Nonagria typhæ* (one, Oct. 29th), *Agrotis suffusa* (Oct. 29th), *Diloba cæruleocephala* (common), *Noctua c-nigrum* (up to Oct. 29th), *Polia flavicincta*, *Anchocelis pistacina*, *Orthosia lota*, *Plusia gamma*, *Miselia oxyacanthæ*, *Phigalia pilosaria* (one male, Dec. 1st), *Himera pennaria* (abundant and very variable, all males), *Hybernia defoliaria*, *Oporabia dilutata* (common), *Cheimatobia brumata* (very abundant), *Cidaria miata* (a few), *C. truncata* (or ? *immanata*) (up to Oct. 24th), *Botys ferrugalis* (one, Oct. 24th).

Of insects taken by other means *Polia flavicincta* occurred on walls up to October 8th, and the following were also noticed:—*Bryophila perla*, *Anchocelis rufina*, *Xanthia silago*, *Hadena protea*, *Xylina rhizolitha*, *Orgyia antiqua*, and *Pionea forficatis*. Larvæ were taken of *Sphinx ligustri*, *Chærocampa porcellus* (Oct. 8th), *Lasiocampa quercus*, *Spilosoma lubricipeda*, *Lophopteryx camolina* (Oct. 26th), *Phalera bucephala*, *Acronycta tridens* (one), *A. psi*, *Abrostola urticae*, *Mamestra brassicae*, *M. persicariae*, *Amphidasys betularia*, *Pieris brassicae*, and *P. rapæ*. The dates appended show how late many of the species were in one of the worst seasons for collecting I have ever experienced.—F. M. B. CARR; The Choir School, The Close, Salisbury.

LEPIDOPTERA IN HERTFORDSHIRE, 1902.—As so many lepidopterists appear to have met with very poor results during last year, I thought some remarks on the species which came under my notice in this county might perhaps be of interest.

In all I have notes on rather more than 220 different species, which I think is a fairly respectable total.

As has been observed by other writers in this Journal, the best and, at times, the only way of obtaining perfect insects was by the employment of light. By this means I obtained about 185 species, some 40 of which were new to my list for this locality (Bushey Heath). The best captures in this line were:—

Lasiocampa quercifolia, *Drepana binaria* (*hamula*), *Notodonta dictæoides* (one), *Luperina cespitis*, *Agrotis porphyrea* (*strigula*), *Hadena thalassina*, *Calymnia pyralina*, *Plusia moneta*, *Ellopia prosapiaria* (*fasciaria*), *Eurymene dolabraria*, *Selenia lunaria*, *Asthena luteata*, *Macaria liturata*, *Aglossa pinguinalis*, *Phycita roborella* (*spissicella*), *Salebria betulæ*, *S. prunosæ*, *Hypochelidia ahenella* (one), *Eurhodope advenella*, *Euzophora pinguis*, *Ephestia elutella*, *Tortrix unifasciana* (one female dark form), *Dictyopteryx læslingiana*, *D. bergmanniana*, *Penthina ochroleucana*, *P. cynosbana*, *Spilonota ocellana*, *S. rosæcolana*, *Sericoris urticana*, *Carpocapsa splendidana*, *Xanthosetia zægana*, *Yponomeuta vigintipunctatus*, *Y. cagahellus*, *Depressaria flavella* (*liturella*).

Sugaring was useless until the end of August, but between the 26th of that month and October 10th I obtained twenty-seven species, among which were *Agrotis puta*, *A. suffusa*, *Noctua c-nigrum*, *Triphæna fimbria*, *Amphipyra pyramidea*, *A. tragopogonis*, *Mania maura*, *Xanthia citrigo*, *Hadena protea*, *Catocala nupta*, *Hypenà rostralis*, *Pyrallis costalis* (all at Bushey Heath); and *Asphalia diluta* and *Polia flavicincta* (at Bricket Wood). *Plusia moneta* occurred in some numbers at the end of July in our garden, and we took a fair number at dusk, hovering over larkspur. *P. gamma* and *Oporabia dilutata* were quite as plentiful as usual, if not more so.

I was not able to devote much time to the Rhopalocera, but the following were noticed in the Tring neighbourhood:—*Lycæna bellargus* (*adonis*), males fairly plentiful, one female (June 27th); *L. alsus* (*minima*) (same date); *L. corydon*, swarms (August); *Hesperia thaumas* (*linea*), five males; *H. comma*, one male. In the same locality I took *Eubolia mensuraria* (*limitata*), *F. bipunctaria*, and *Carpocapsa grossana*, the last beaten out of beech. One *Vanessa io* was seen in our garden in the summer. Can anyone suggest a reason for the apparent rarity of this species in more than one locality during the last three or four years?—PHILIP J. BARRAUD; Bushey Heath, Herts.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—*January 21st, 1903.*—The Seventieth Annual Meeting. The Rev. Canon Fowler, M.A., D.Sc., President, in the chair. After an abstract of the Treasurer's accounts, showing a satisfactory balance in the Society's favour, had been read by the Auditor, Mr. H. Goss, one of the Secretaries, read the Report of the Council. It was then announced that the following had been elected Officers and Council for the Session 1903–1904:—President, Professor Edward B. Poulton, M.A., D.Sc., F.R.S.; Treasurer, Mr. Robert McLachlan, F.R.S.; Secretaries, Mr. Herbert Goss, F.L.S., and Mr. Henry Rowland-Brown, M.A.; Librarian, Mr. George C. Champion, F.Z.S.; and as other Members of Council, Colonel Charles T. Bingham, F.Z.S.; Mr. Malcolm Burr, B.A., F.L.S.; Dr. Thomas A. Chapman, F.Z.S.; Mr. Arthur John Chitty, M.A.; Mr. Hamilton H. C. J. Druce, F.Z.S.; the Rev. Canon Fowler, M.A., D.Sc., F.L.S.; Professor Raphael Meldola, F.R.S.; Professor Louis Compton Miall, F.R.S.; the Rev. Francis D. Morice, M.A.; Dr. David Sharp, M.A., F.R.S.; Colonel Charles Swinhoe, M.A., F.L.S.; and Colonel John W. Yerbury, R.A., F.Z.S. It was announced that Professor Poulton, the new President, would appoint the Rev. Dr. Fowler, Professor Meldola, F.R.S., and Dr. D. Sharp, F.R.S., as Vice-Presidents for the Session 1903–1904. Canon Fowler, the retiring President, in the first part of his Address, dealt chiefly with the many facts that have been recently brought forward with regard to Cryptic Coloration and Mimicry, more especially as affecting the Order Coleoptera; the facts are indisputable, but the hypotheses founded upon them are, perhaps, sometimes pressed too far. In the second part the question of the origin of the Coleoptera was discussed:

there is no satisfactory evidence of the appearance of the Order in the Palæozoic period, but the leading families are found in the Lias, as completely differentiated as at the present time; in fact, many of the genera and even the species are almost identical with those now living; the Coleoptera, that is to say, have altered but little from the time at which they existed side by side with the gigantic extinct Saurians and the Pterodaactyles; the whole question of the origin and history of the insects generally is of the first importance in the history of evolution. A vote of thanks to the President was proposed by Professor Poulton, and seconded by Professor Meldola. The President replied. A vote of thanks to the Officers was proposed by Professor Meldola, and seconded by Mr. C. O. Waterhouse. Mr. McLachlan, Mr. Goss, and Mr. Rowland-Brown replied.—H. Goss, *Hon. Sec.*

SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—*November 27th, 1902.*—Mr. F. Noad Clark, President, in the chair.—Mr. E. J. Hare, East Dulwich Grove, S.E., was elected a member. The meeting was devoted to a special exhibition of notable captures and varieties, and was, as usual, a very successful gathering. Between eighty and ninety members and their friends attended, and a large number of exhibits were made.—Messrs. Harrison and Main exhibited very varied series of several species of Lepidoptera recently taken in the Shetland Isles, including *Eupithecia nanata*, *Dianthæcia nana* (*conspersa*), smoky and dark forms; *Noctua festiva* var. *conflua*, and *Anarta melanopa*, with normal types for comparison.—Mr. Cant, a pair of the extremely dark form of *Hemerophila abruptaria*, taken this year in Regent's Park.—Mr. Kaye, long series of *Anchocelis lunosa*, with the forms *obsoleta*, *humilis*, *brunnea*, *neurodes*, and *agrotoides*; see Brit. Noct. ii. 168–170. He had not met with var. *rufa*, which was said to be common.—Mr. R. Adkin, examples and series of hybrid Lepidoptera, and read notes on their life-history: (1) *Smerinthus ocellata* ♂ × *Amorpha* (*Smerinthus*) *populi* ♀; (2) *Selenia bilunaria* (*illunaria*) ♂ × *Selenia tetralunaria* (*illustraria*) ♀; (3) *Pygæra pigra* (*reclusa*) ♂ × *P. curtula* ♀; and (4) *P. curtula* ♂ × *P. pigra* ♀. In the two last series the female influence was dominant; in the two former cases the characters of male and female were pretty evenly shared or deleted.—Mr. Carpenter, specimens of *Apatura iris* bred from larvæ he had hybernated, and on behalf of Mr. Oldaker: (1) *Lycæna* (*Polygonmatus*) *icarus*, a gynandromorph, left side male, right side female, taken June 14th, 1902. (2) a male with under side having faint marginal spots, and only one spot on central area of ashy grey, taken June 7th; both were from Rammore Common. (3) a male about the size of an average *Lycæna* (*Cupido*) *minima*. And (4) a var. of *Vanessa* (*Eu Vanessa*) *antiopa*, bred from German larvæ, with no blue spots on upper wings and only one blue spot on the lower wings.—Mr. Scollick, an example of *Vanessa* (*Aglaïs*) *urticæ*, with ground colour resembling that of *Vanessa* (*Eugonia*) *polychloros*, and a *Plusia chrysitis*, with the usually burnished appearance greatly curtailed on one side.—Mr. Hare, a *Strenia clathrata*, with nearly the whole of the lighter markings of the type obliterated, taken at Marlborough; and an *Ephippiphora obscurana* (*gallicolana*), with the dorsal blotch suffused with fuscus.—Mr. J. A. Clark, an almost white var. of *Agrotis suffusa*, taken in September in South Devon, and two

hybrid *S. ocellata* ♂ × *S. populi* ♀.—Mr. Lucas, several examples of the dragonfly, *Oxygastra curtisii*, from Hants, with nymph-skins from France; and several specimens of the earwig, *Labidura riparia*, from Bournemouth. On behalf of Mr. Anson, a series of *Agriopsis aprilina*, bred from the New Forest, and having very dark lower wings.—Mr. G. T. Porritt, the Huddersfield range of forms of *Polia chi*, from almost white to dark slate, including the forms *olivacea* and *suffusa*.—Mr. Joy, aberrations of *Aphantopus* (*Epinephele*) *hyperanthus*, from Folkestone, mainly showing a tendency to diminution of the eye-spots.—Mr. Main, on behalf of Mr. Mera, a series of very dark *Odontopera bidentata*, bred from Leeds; and a brilliant green example of *Mimas* (*Smerinthus*) *tilia*, bred in the London district.—Mr. Turner, three forms of *Melanippe montanata* taken at Amersham, Bucks, in June: (1) all the marking obsolete or very faint, except a costal blotch; (2) asymmetrical, with the lower half of central band on left fore wing very narrow; (3) a light form, showing a darker marginal shade to all the wings. Mr. Russel, a *Pyrameis cardui* having apex of fore wings much shortened, with marking much compressed, but in perfect symmetry, taken at Margate.—Mr. Hamm, a photograph of a *Papilio machaon*, bred from Wicken, with asymmetrical wings and markings; hind wings were elongated and antennæ shorter. A large amount of irregular black suffusion was present on all four wings.—Mr. Edwards, a case exhibiting some of the extreme forms of Satyridæ as shown in the genera *Hetera*, *Citheronia*, *Pierella*, and *Antirrhæa*.—Mr. Henderson, series of *Xanthia* (*Citria*) *fulvago* (*cerago*) and *Eupithecia tenuiata*, bred from sallow catkins in Surrey, and a well-marked series of *E. rectangulata* from Berkshire.—Mr. Rayward, pupæ of *Papilio machaon*, showing assimilation in colour to their surroundings.—Dr. Chapman: (1) forms of *Canonympha pamphilus* from France, Italy, Switzerland, Norway, and Spain, illustrating the variation in marginal colouring, development of ocelli, ground colour, and general markings, with the extreme form *lyllus*; (2) *Lycana* (*Polyommatus*) *corydon*, Swiss forms, *corydonius* from Spain, and two forms of *hispana* from Spain; (3) *Erebia stygne* var. *bejarensis*, large and more richly coloured; (4) *Lycana* (*Plebeius*) *argus* var. *bejarensis*, much larger and more brilliantly marked and coloured, suggesting that *argus* (*ægon*), *zephyrus*, and *lycidas* are local forms of one species.—Mr. Tonge: (1) *Strenia clathrata*, black var. from Andover; (2) *Phyllocnistis suffusella*, a fine bred series from Reigate; (3) *Lithocolletis quercifoliella*, bred from oak and beech; (4) *L. clerkella*, dark and some nearly black, with suffused markings, bred from cocoons found on cherry by Dr. Chapman.—Mr. Harrison, on behalf of Mr. C. P. Pickett, a large number of aberrations of British Lycænidae, *Mimas* (*Smerinthus*) *tilia* and *Angeronia prunaria*.

December 11th.—The President in the chair.—Mr. Cowham, of Stoke Newington, was elected a member.—Mr. South exhibited, for Mr. Arkle, of Chester: (1) *Ematurga atomaria* female, having the ground colour unusually white, and the markings much intensified, with a wide submarginal black band on all four wings; (2) a series of *Canonympha typhon*, from Delamere Forest. The specimens, which were of the *rothlebi* form, showed considerable variation in size, number, and shape of the ocelli on both surfaces, and also in the amount of white marking on the under side of the hind wings. In two examples the

ocelli were oval in shape, and their outer edges projected. In another specimen the ocelli on the under side of the hind wings were large, especially the two nearest anal angle. The white markings of a fourth specimen were unusually developed, and consisted of a broad irregular-edged transverse band reduced to a slender line between veins 2 and 4, an elongate patch at the base below the costa, and a curved and tapered streak beneath the discoidal cell extending to the band. (3) A melanic example of *Cymatophora duplariis*; (4) *Thera variata*, having the central band nearly black, and the rest of the wing of a light brown; (5) a melanic *Agrotis exclamationis*.—Mr. Ashdown specimens of the Homopteron *Ledra aurita*, taken at Mickleham together with larvæ from the New Forest. Mr. Turner recorded the species from Chattenden Woods, and Mr. West from West Wickham. —Mr. R. Adkin, a specimen of *Euchloë cardamines*, having the discoidal spot reduced to a mere speck.—Mr. Goulton, an example of *Catocala nupta* from Balham, showing a general darkening in colour. Dr. Chapman, cocoons of *Nudaria murina* and *Euchromia lethe*, showing the larval hairs similarly made use of, but with different effects, owing to the cocoon in one case being slight, while in the other it was dense; and the hairs in the former few and long, while in the latter they were short and abundant.—Mr. Turner, a pair of a large *Tarantula* sp.? from Trinidad, together with a species of *Automeris* from the same place.—Mr. Kirkaldy gave an account of a tour he had recently made in Italy and Switzerland, illustrating his remarks with a large number of photographs.—Hy. J. TURNER, *Hon. Report Sec.*

BIRMINGHAM ENTOMOLOGICAL SOCIETY.—November 17th, 1902.—Mr. G. T. Bethune-Baker, President, in the chair.—Mr. R. C. Bradley showed a series of *Panurgus ursinus*, taken at Barmouth this summer; also specimens of *Catabomba pyrastris* and *selenitica*, one each from Barmouth, in which the usual colouration of the pale markings on the abdomen was reversed, those of *pyrastris* being yellow, and those of *selenitica* white; also var. *unicolor* of *pyrastris*, from Moseley. Mr. Wainwright suggested that the colours of the spots had been affected in the killing by sulphur, &c., but Mr. Bradley thought not.—Mr. A. H. Martineau showed various insects:—*Vanessa polychloros* from Budleigh Salterton, South Devon, and *Melanargia galatea* from Sidmouth; also *Cerceris arenaria* from Budleigh, together with its weevil prey, which was captured with it; and *Tabanus autumnalis*, which was taken in the house at Budleigh. Mr. Wainwright said he had several times seen *Tabani* indoors.—Mr. A. D. Imms, *Erythromma najas*, from Yardley Wood, a species of dragonfly which seems to be local and not common in this country, but which Mr. Bradley has already made known from one local place, Sutton Park; also *Sympetrum striolatum*, taken in his own garden at Moseley.—Mr. G. T. Bethune-Baker, a long series of *Ematurga atomaria*, from the hills above Curwen, which showed much variation in the shape of the wings, in markings and coloration; some of the females closely approximated to the colour and pattern of the males. It was remarked that all alike were pale in comparison with our local ones, especially contrasting with Cannock examples. Some were so pale that on the wing they looked quite white.—COLBRAN J. WAINWRIGHT, *Hon. Sec.*

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THE EARLIER STAGES OF *LYCÆNA ARION*.

By F. W. FROHAWK, M.B.O.U., F.E.S.

SINCE my last notes on the earlier stages of *Lycæna arion*, published in the 'Entomologist,' vol. xxxii. p. 104 (May, 1899), I have been yearly endeavouring to solve the mystery which still surrounds the last stages of the larva. Before dealing with the slight advances I have gained concerning its economy, I will describe the larva in its first stage, which I omitted doing in my previous notes, so that the descriptions of its first four stages may be complete.

The larva, directly after emergence, is exceedingly small, measuring only $\frac{1}{32}$ in. long; it is rather stout in proportion; the segmental divisions are deeply defined, and with a longitudinal dorsal furrow; on the first segment is a large dorsal darkly coloured disk, and a smaller one on the anal segment. The colour of the body is pale ochreous yellow, tinged with greenish; on the dorsal surface are longitudinal rows of glassy white serrated hairs, placed in two pairs on each side of each segment above the spiracles, the dorsal row all curve backwards, the anterior one on each segment is much the longest, and all have pedestal-like bases of an olive colour, the subdorsal pair are both short, the anterior one curving forwards, the posterior one backwards; below the spiracle, which is black, are three brownish-coloured serrated hairs placed in a triangle, all project laterally, and have dark bases; the central one is very long; below these, on the first lateral lobe of each segment, is a single simple white hair, and two other similar ones on the base of each clasper. The head is of a shining olive-black. The whole surface of the body is densely sprinkled with blackish points, giving it a rough appearance, and adding to the appearance of the depth of the

segmental divisions ; the legs and claspers are similar in colour to the body.

From observations I made last year concerning the deposition of the eggs in a natural state, I felt convinced that some connection existed between *arion* larvæ and the common yellow ant (*Formica flava*) by the preference shown by the butterfly in selecting the thyme growing on ant-hills for oviposition. Therefore, the following extracts from my note-book may be of interest, as they throw some light on the habits of both *arion* larvæ and of the ants.

From July 5th to 17th inclusive found *L. arion* numerous. During this period I watched several females depositing, and on the last day saw four laying their eggs on thyme-blossom on the top of a hill ; the thyme grew in patches among the short turf (and on the ant-hills), which was composed of the usual small plants which clothe the surface of the Cornish downs, and with a few furze-bushes dotted about ; but the plants selected were those growing in the open, and some distance from the furze-bushes, therefore fully exposed to wind and rain. Under every patch of thyme visited by the female butterflies I found ants' nests. I also saw other females deposit on the thyme growing on ant-hills, and also on the thyme upon the turf-walls, where ants are likewise in abundance. Several captured females deposited on plants potted up during the last three weeks of July. On Aug. 8th I had larvæ in four different stages, some only just hatched, one over the third moult, and others fixed for third moult, a large number after first and second moults ; after moulting they ate part, and in some cases nearly all, the cast skins.

On July 29th I found two of the larvæ rolling about together under the thyme blossom ; upon close examination I found the smaller one had seized the larger with its jaws, which were buried into its side, apparently sucking it. Upon pulling them apart I placed the victim under the microscope, and found a deep hole in its side, with the surrounding surface shrunken, and liquid exuding from the wound. This conclusively proves the cannibalistic habits of these larvæ, which I had always suspected, as on previous occasions large numbers of larvæ had disappeared in a mysterious manner. I then placed about fifty larvæ on as many sprigs of thyme, so as to keep them separate and under very close observation.

On Aug. 11th, many having passed their third moult, when they cease feeding on thyme, I started investigating what relation there might be between the larvæ and ants, thinking in all probability that they might feed either on the larvæ or pupæ of the latter. I at first selected one of the larvæ after the second moult to experiment with, as I found that after the third moult they do not attack each other ; so that their cannibalistic habits

only exist during the first three stages. I supplied this larva with an ant's cocoon with one end removed; it at once began eating it. I then placed them under the low power of the microscope to carefully watch the proceedings, which were interesting. I watched it feeding on the jelly-like substance of the pupa, as well as the cocoon, which it ate in the same manner as it would a leaf, by biting the edge. It fed for several minutes. This seemed so far satisfactory, as I thought I had found the right food for the larvæ in their subsequent stages, but this proved not to be the case. Having found a dead *arion* larva, I placed it in a box with some ants, which immediately seized hold of it, apparently intending to kill it. I then put a live larva in another box with four ants (*F. flava*), and expected them to treat it in the same way, but was surprised to find them act quite the reverse; they all immediately ran to it, and, waving their antennæ over and upon it, at the same time closed their jaws, and then apparently smelt and licked it, and seemed particularly attracted to the hinder part of its back, about the tenth segment. First one and then another of the ants would run over the larva, and then stop to lick that part of its back. I then noticed a tiny bead of moisture appear, and one of the ants touched it with its mouth, which instantly caused the bead to disappear. I afterwards placed both larva and ants under the microscope, which at once revealed the cause of attraction, for there on the tenth segment I found a small elongated transverse gland on the dorsal surface. I then examined with the microscope another larva in the same stage while it was feeding, during which operation the gland is kept throbbing; so I placed the ants close to it, and soon saw them run over it (of course, under the microscope only a foot or part of an ant would appear in the field). Directly a foot touched the gland, or very near it, it immediately throbbed more violently, and swelled up. It then ejected a globule of clear white liquid. At the same instant the head of an ant appeared, and licked up the drop. In a few seconds a foot again touched the gland, and another bead of liquid oozed out, which was at once again licked up by an ant. An interesting fact is that the larva unheeded the ants running over and around it while it kept feeding; but the gland is apparently extremely sensitive to the touch of an ant's foot. Although I have several times touched the glands of several larvæ with the point of a very fine sable-hair brush, they would at once wince and contract, but on no account could I induce the exudation of the liquid; but directly an ant's foot, or the claws of the foot, touched it a bead would appear, and at once be imbibed by the ants. Although the larva was kept in a box with numerous ants, both workers and winged females, together with their pupæ, the ants one and all acted precisely similarly; not one attempted to bite

the larva, but as soon as they touched it they slowly closed their jaws, and waved their antennæ over and upon it.

The gland is of peculiar construction, being formed of flexible tissue, and surrounded by numerous glassy white pyriform processes varying in size; some are extremely minute; those bordering the edges of the gland are furnished with excessively small white bristles, each process bearing four or five; these are in the form of a fan with diverging points, and all are directed towards the central aperture, the whole forming a fringe surrounding the gland, and are obviously for the purpose of holding the bead of liquid in place, and probably also serve as a protection to this apparently sensitive organ.

The larvæ appear to be perfectly at home with the ants, as neither molest each other. In this stage (after third moult), I have been unable to perceive any attempt at cannibalism among the larvæ, although, as I have pointed out, this habit exists in the earlier stages.

As I have alluded in these notes to the larva *feeding* during the fourth stage, I may mention that I discovered, after trying over three dozen different plants, a certain food upon which I induced them to feed for many weeks, during which time they slowly grew from $\frac{1}{8}$ to $\frac{1}{4}$ in. in length.

February, 1903.

SPECIES OF THE GENERA *EMMELESIA* AND *EUPITHECIA* TAKEN IN ROXBURGHSHIRE.

By W. RENTON.

Emmelesia affinitata.—Not very common. I have taken it near Hawick, Minto Woods, Wells Woods, Kelso, and St. Boswell's; and have found larvæ feeding on the seeds of red campion near Jedburgh, August.

E. alchemillata.—Generally abundant throughout the county; the larvæ feeding on the seeds of the stinging nettle (*Urtica urens*), August and September.

E. albulata.—Common where it occurs. I have found it by beating hedgerows; also on grass-banks, woods, and moors. In the locality of Hawick, Jedburgh, Kelso, &c. Taken the larvæ feeding on seeds of yellow rattle, July and August.

E. decolorata.—More or less common over the county in July. Collected larva from red campion in August.

E. unifasciata.—Much less common than the two last preceding species. I have taken the imago resting on wire fences on Kirton Moor, Bellion Moor, in July. The larva is unknown to me.

E. minorata (ericetata).—Very common on moors and pasture ground all over the county. This larva is also unknown to me. It is said to feed on heath; I have, however, found the imago on grass-ground two to four miles from heath.

Eupithecia venosata.—Rare and local; near Hawick and Minto Woods, in June and July. I have never bred this species, but always took specimens in the locality of campions.

E. pulchellata.—One near St. Boswell's, June 5th, 1901.

E. subfulvata.—Common in general over the county, resting on palings and stone walls. Larvæ common in May and June on yarrow and milfoil. The imago is on the wing in August and September.

E. plumbeolata.—Rare in the Duke Woods, near Hawick, and Muirfield Moss, June and July.

E. pygmaea.—Common in general where *Urtica urens* grows, in hedgerows, woods, &c. The larvæ feed on the seeds, July, August, and September.

E. helveticaria.—Common on junipers, Fallside Moor, June. Larva August and September.

E. satyrata.—Very common all over the county, June and July.

E. castigata.—Another common species in general over the county July.

E. trisignaria.—Common near Hawick, resting on stone walls, dis-used quarries, and rocks on moors, June and July. I have taken the larva on wild angelica in August. I never took this species anywhere except in the neighbourhood of Hawick.

E. fraxinata.—Rare on the banks of the Teviot from Hawick to Kelso, June. Larva unknown to me.

E. indigata.—Common in all the Scotch-fir woods, June and July. Second brood in September.

E. nanata.—Another common species on moors from May to August.

E. vulgata.—Common outside of woods from May to July. In general over the county; bred this species from willow.

E. minutata.—A rather common species on Kirton Moor, near the Fox Cover, the only locality in which I have taken it; June and July.

E. assimilata.—Common in gardens throughout the summer. I have reared the imago from larvæ collected on black currant and gooseberry.

E. tenuiata.—Local in Wells Woods and Minto Woods, July; taken the larvæ from sallow catkins, April.

E. lariciata.—More or less common in woods, June and July.

E. abbreviata.—Common some seasons at sallows, April and May. I have bred this species from blackthorn.

E. exigua.—Common generally among thorn, May, June, and July. Larvæ on whitethorn in August.

E. sobrinata.—Larva common on junipers, Fallside Moor, June. I have bred them from blackthorn when my food-plant got too dry and old. This species is variable.

E. togata.—Very local and rare in fir-woods, Hawick, Kelso, and Jedburgh, in June, on the trunks or palings around the wood.

E. coronata.—Rare in Wells Woods, June. This is the only locality where I have taken the species in Roxburghshire.

E. rectangulata.—Local in gardens and hedgerows, June and July. Collected larvæ in May from apple-blossom.

DESCRIPTIONS OF SOME NEW SPECIES OF CLYTHRIDÆ
(PHYTOPHAGOUS COLEOPTERA).

BY MARTIN JACOBY.

THE following species, which are contained in my collection, and for the greater part belonging to the genus *Melitonoma*, I am unable to refer to any of those described by Lacordaire or since. The species are very difficult to separate, of nearly uniform colouration, and very variable, so that structural differences are the only reliable guard with the position of the elytral spots in connection.

MELITONOMA TERMINATA, sp. n.

Black; thorax fulvous, extremely finely and closely punctured, the base with a black band; elytra more distinctly and very closely punctured, fulvous, a spot on the shoulders, two placed transversely at the middle, a transverse band near the apex, and the apical margins black.

Var.—Thorax entirely fulvous. Length, 6 mill.

Hab. Bar el Salaam, East Africa.

Of cylindrical shape; the head black, impunctate, the vertex convex, the lower portion finely strigose, anterior margin of the clypeus nearly straight, labrum black; antennæ extending to the base of the thorax, black, the lower three joints fulvous; thorax strongly transverse, narrowed at the sides, the latter rounded, as well as the posterior angles, the surface extremely closely and finely punctured throughout, the basal margin rather broadly produced at the middle, the disc fulvous, the base with a transverse black band, which sends off upwards at each side a short branch; scutellum black; elytra extremely closely and more strongly punctured than the thorax, fulvous, the shoulders with one, the middle with two spots placed transversely, another transverse band below the middle, the margins of which are strongly sinuate, and the extreme apex of each elytron black; under side and legs black, or the tibiæ and tarsi fulvous.

I possess two specimens of this species, which differ in regard to the presence or absence of the thoracic band and the colour of the legs, but in no other way; the closely and finely punctured thorax and the apical black elytral spots will separate this species from any other of the genus.

MELITONOMA CAPITATA, sp. n.

Fulvous; the breast, abdomen, and the femora black; head and thorax impunctate, epistome nearly straight anteriorly; elytra very finely punctured, with the usual five black spots (1, 2, 2). Length, 6 mill.

Hab. Delagoa Bay.

It will only be necessary to point out that this species differs from any of its allies (*M. epistomalis*, Lac., excepted) in the entirely fulvous

head, and in the nearly straight anterior margin of the epistome, but more specially in the sides of the head, which are prolonged subquadrately below the eyes; the thorax does not differ from other species of the genus, being narrowed at the sides, and the surface is unspotted; the elytral punctuation is very fine, nearly obsolete at the apex, and partly arranged in irregular rows; the tibiæ and tarsi are fulvous.

I possess a single apparently female specimen, which was obtained by the late Mrs. Monteiro.

MELITONOMA BOMAENSIS, sp. n.

Bluish black below; the tibiæ and tarsi flavous; head black; thorax flavous, impunctate, with two lateral and one central black spot; elytra closely and distinctly punctured, flavous, each with five spots (1, 2, 2), the last two obliquely placed. Length, 6 mill.

Hab. Boma (Congo); Angola, Delagoa Bay, Sierra Leone.

Head black, impunctate, finely pubescent between the eyes, the clypeus feebly semicircularly emarginate anteriorly; antennæ black, the lower four joints fulvous; thorax strongly transverse, the sides greatly deflexed, nearly straight but slightly narrowed, the disc entirely impunctate, flavous, with a basal subquadrate spot at each side, and another small intermediate spot; scutellum black, pointed, with a slight central ridge; elytra feebly lobed at the sides, subcylindrical, rather strongly and closely punctured, the punctures arranged in very irregular rows; a spot on the shoulders, two others at the middle, placed transversely in a line, and two below the middle, the outer one of which is placed lower than the other, black; below and the femora bluish black, the tibiæ and tarsi flavous.

The position of the posterior spots, which is nearer the apex than in most other allied species of the genus, and their oblique direction, as well as the colour of the tibiæ and tarsi, distinguish this species, of which I have six specimens before me. Also collection H. Clavareau.

MELITONOMA PUNCTIPENNIS, sp. n.

Bluish black; the head finely pubescent; thorax fulvous, impunctate, with five black spots; elytra very strongly punctured, fulvous; a spot on the shoulders, a transverse band at the middle, and another near the apex, blue-black. Length, 6 mill.

Hab. Niger, Benué Exped. (Staudinger).

Head black, shining, impunctate, the vertex convex, lower portion pubescent; eyes large; antennæ not extending to the base of the thorax, black, the second and third joints obscure fulvous; thorax twice as broad as long, very slightly narrowed in front, the disc convex, entirely impunctate, flavous, the base with a subquadrate black spot at each side; the disc with three other small spots placed triangularly between the larger ones; scutellum black, pointed; elytra feebly lobed at the sides, strongly and closely punctured in irregular rows; the shoulders with a rather large round spot, the middle with a

transverse medially narrowed band, and followed by another one near the apex, the second band with the posterior margin deeply concave, neither of them extending to the sutural and lateral margins; under side and legs black.

Of this species I have only a single female specimen before me, but the strong punctuation of the elytra differs so much from any of its allies that it cannot be mistaken for any other species. *Clythra notata*, Klug, resembles the present insect greatly, but is of larger size; the head is differently coloured, the thorax of different shape and markings, and the elytral bands likewise differ, as well as the sculpture.

(To be continued.)

ON THE MORPHOLOGY AND CLASSIFICATION OF THE AUCHENORRHYNCHOUS HOMOPTERA.

By DR. H. J. HANSEN.

(Continued from p. 44.)

THE posterior tibiæ in a more typical Jassine—for example, a *Tettigonia* or *Idiocerus*—are, as is well known, *quadricarinate*, and also more or less conspicuously *compressed* (or at least never depressed), so that the posterior* surface is narrower than the surfaces on both sides, and, in every case, than the *anterior* surface; moreover, at least, the two margins which limit the posterior surface are endowed with several or many spines. A similar structure is found in the fine Australian genus *Eurymela*, Hoffmansegg, which in consequence of its entire structure may well stay in the neighbourhood of the Bythoscopine group. The genus *Paropia*, Germ., which is ranged by Sahlberg as a somewhat aberrant group even beyond *Ulopa*, by Kirschbaum and Fieber as representing a peculiar family, seems to me to be a *very good Jassine* in the structure of posterior tibiæ, the cheeks, antennæ, &c.; to lay great stress on excavations on the frons and vertex appears to me extremely absurd. *Paropia* ought, it seems to me, to stand, judging from its whole structure, in the neighbourhood of the Bythoscopini. The interesting genus *Ledra*, F., seems, at a first glance, to diverge strongly from the other Jassinæ by the remarkable head, the often two-flapped pronotum, and the cultrate posterior tibiæ; it is on this account signalized by Fieber as representing a family, by Sahlberg (*l. c.* p. 103) as forming a transition to the Membracinæ, “to which it is by some authors referred,” a supposition entirely without good

* The nomenclature of various surfaces here and later on is not always strictly in accordance with the original. Any alteration is either initiated or endorsed by the author.—G. W. K.

grounds. In the forms akin to *Ledra*, such as *Petalocera bohemanni*, Stål, *Epiclines planata*, F., and *Proranus adspersipennis*, Stål, the posterior tibiæ are quadricarinate, compressed, and the posterior margins spinose, the latter being especially notable in the last-named form; the cultrate form occurring in *Ledra* is only a strong compression, so that the outer surface has disappeared as such. The cheeks (*genæ*) are in *Ledra aurita*, L., somewhat expanded, in *Petalocera* and many of the related forms—*Tituria*, Stål, *Titia*, Stål, *Sichæa*, Stål, *Rubria*, Stål (according to Stål's statement in Hem. Afr.)—"very slightly dilated"; and the last-named genus seems to lead over to *Xerophlœa*, Germ., which is a good Jassinæ with somewhat expanded cheeks. The antennæ in *Ledra aurita* are also (see above) formed as in the Jassinæ, and by no means resemble the antennæ in that Membracine-form, in whose neighbourhood *Ledra* should probably stay, viz. *Æthalion*, Latr. *Ulopa* diverges, on the contrary (see later on), essentially from Jassinæ, and must pass over to Membracinæ, but after the removal of this genus the Jassinæ in the above-given circuit seem to me to be a very natural division—a "Subfamily," characterized by the more or less dilated cheeks, the typical quadricarinate, compressed (sometimes cultrate) posterior tibiæ (and the slender antennal whip, which, however, is not an exclusive character).

The remaining part of the family Jassidæ may perchance be comprised as one division, Membracinæ. It is, as regards the structure of the head, antennæ, and posterior legs, far more multifarious than the Jassinæ; one can scarcely find positive characters for it as a whole, and it ought perhaps, as proposed by Stål, to be separated into several groups equivalent with Jassinæ; but most of these groups will probably not coincide with Stål's "Subfamilies."

A character probably met with in all the forms, and binding them together, can be expressed thus: "*cheeks scarcely or not at all dilated.*" A group of the Membracinæ—the "*Hoplophorida*," Stål—is characterized by the arranger (Hem. Afr. p. 82), "*posterior tarsi small, shorter than the anterior pair*"; but it is not quite so sharply expressed as it could be, as their posterior tarsi are in reality *far thinner* and *nearly double* as short as, for example, the intermediate tarsi; and besides, this character is not exclusive, for I am acquainted with forms, which certainly in every way are referable to the subfamily "*Membracida*," Stål, in which the posterior tarsi are clearly shorter and more slender than the other pairs, to almost as great a degree as in the "*Hoplophorida*." On the other hand, the group certainly shows always a character peculiar to it, viz. the posterior tibiæ are for the greatest part of their length *considerably compressed obliquely, and towards the apex curved first of all inwards and then again outwards*. In the above-mentioned Membracis-forms with the

short posterior tarsi, the tibiæ are curved somewhat backwards at the apex, but they do not resemble those in the Hoplophorini, being besides to a high degree *depressed*, not compressed. The presence of this interesting *oblique* compression in the little group (the Hoplophorini) renders it impossible for me to refer the form of their structure to the plan which presumably is expressed in the shape of the posterior tibiæ in all remaining Membracinae. If one examines the posterior tibiæ—for example, in *Ulopa*, Fall., *Athalion*, Latr., *Centrotus*, F., *Darnis*, F., *Smilia*, Germ., and very many important genera—it is seen that they are tricarinate, most often sharply tricarinate, with strong bristles on the margins, and that the *posterior surface is always broad*, scarcely ever narrower, most often broader than the other surfaces, so that the posterior tibiæ never display a tendency towards compression, as in Jassinæ, but contrariwise are often somewhat *depressed*; only in *Polyglypta*, Burm., have I found them almost round, the edges being strongly rounded off. In the group “Membracida,” Stål, and various genera of “Centrotida,” Stål, the depressing is, as is well known, so far carried on that the tibiæ are foliaceous. In various species of the genus *Aconophora*, Fairm., in *Heteronotus*, Lap., and many forms, the tibiæ have a tendency to become quadricarinate, so that on the anterior side one finds two *sub-contiguous* rows of small spines or bristles, but they are clearly depressed,* and the *posterior surface is very broad and altogether dominant*. It may be objected that this characterization lacks sharpness, but it seems obvious to me, nevertheless, that, despite all secondary changes, essential differences are typically found in the structure of the posterior legs in the Jassinæ and Membracinae in the circumscription of these here set forth.

In the Hem. Afr. pp. 82–83, Stål separates his first five sub-families from the “Centrotida” by “Scutellum absent or obsolete, not extended beyond the metanotum,” in opposition to the fact in Centrotida: “Scutellum distinct, produced backwards beyond the metanotum.” In the first place, this character is wrongly expressed, because if one removes the pronotal posterior lobe—for example, in *Smilia*—one finds a good-sized scutellum, and one can therefore only state to what degree the scutellum is hidden or visible; in the second place, the other part of the character is not correct, for Stål himself writes on the Centrotid genus *Oeda*, Am. and Serv., in ‘Hemiptera Fabriciana,’ p. 49, “no complete scutellum,” in contradistinction to “scutellum complete, produced”—for example, in *Stegaspis*, Germ.; thirdly, the character may well be practically useful, but effects, in my opinion, an artificial, not a natural, separation; for genera like *Hypsauchenia*, Germ., and *Lycoderes*, Germ., stand far nearer,

* In the original, “sammentrykte” is a misprint, so the author informs me, for “fladtrykte.”—G. W. K.

in my opinion, by the structure of the legs and antennæ, to *Membracis*, F., and *Pterygia*, Lap., than to *Centrotus*, not to mention *Oeda*, Am. and Serv., *Bocygium*, Latr., *Tolania*, and other Centrotid genera. My opinion is thus that the group Centrotida, Stål, may be rejected, and the genera with strongly dilated tibiæ referred to "*Membracida*," Stål, which group then becomes very natural, and can, indeed, be redivided according to the structure of the face, *i.e.* whether this be widened to a prominent sharply margined plate, both at the sides and downwards (as in *Membracis*, F., *Bolbonota*, Am. and Serv., *Pterygia*, Lap.), or only dilated at the sides (*Oxyrhachis*, Germ., *Lycoderes*, Germ.). How to separate the other types of the division Membracina, mihi (after the removal of "*Hoplophorida*" and "*Membracida*," in the new sense proposed by me), I dare not attempt, but simply state that they may best be discerpted into some smaller groups; only I must say that I am certain that *Æthalion* ought to rest in the neighbourhood of *Centrotus-Tolania* (*cfr.* Stål), which also it approaches by the antennal structure (see p. 39).^{*} Next ought perhaps *Ulopa*, according to the structure of head and antennæ, to form a small division by itself near the *Centrotus* group; Stål, in 1858, placed it in Membracina, but in 1866, certainly, removed it to Jassida.

(To be continued.)

NOTES AND OBSERVATIONS.

NEW FOREST NATURAL HISTORY SOCIETY.—We learn from a circular received from the hon. secretary—Mr. G. Morris, of Brockenhurst, Hants—that a Natural History Society bearing the above title has been established. Although the subscription is very small, the scheme of operations seems to be distinctly large. Among other useful work that the Society proposes to undertake, "as soon as funds permit," is that of publishing "a Monthly Report and District Floral and Faunal Guide, for the benefit of members and correspondents." Although the Society will discourage the possible exterminator of rare plants, insects, &c., it will always be prepared to furnish non-resident members who may visit the district with information as to localities and times of appearance of such rarities as they may wish to obtain, and so save their valuable time.

VANESSA IO, AB. CYANOSTICTA.—I am more and more convinced of the value and convenience of varietal names, especially in the case of the Diurni and the more conspicuous species amongst the Macro-Lepidoptera generally. I have therefore much pleasure in bestowing the name of *cyanosticta* on that form of *Vanessa io* in which a single blue spot (varying considerably in size) is found beneath the "peacock eye" on the hind wing. It does not seem to be mentioned in any of

^{*} Vol. xxxiii., p. 119, of translation.—G. W. K.

the text-books to which I have access, but is well known to a good many collectors and is not of very rare occurrence. I bred about half-a-dozen specimens from a single batch of larvæ found here last season.—(Rev.) GILBERT H. RAYNOR; Hazeleigh Rectory, Maldon, Feb. 20th, 1903.

KESTREL DESTROYING BUTTERFLIES.—I have been asked by my friend Mr. Banks, of Corfe Castle, to send you a note of a habit of the kestrel which has on several occasions fallen under my notice. On the 13th July, 1901, I was in company with my brother, Mr. E. Harker Curtis, on the top of Ballard Down, Swanage, catching butterflies. The species noticed were mostly *Melanargia galatea*, *Argynnis aglaia*, *Hipparchia semele*, *H. tithonus*, and *H. janira*. Whilst thus engaged, a kestrel (*Falco tinnunculus*) was observed hawking about and hovering over the long grass, every once now and then dropping like a stone to the ground, remaining a second or two and then rising again. These movements attracted my attention, so my brother and I lay down in the grass to watch the bird. After some time I remarked to my brother that the bird did not seem to get much, as it never rose with a mouse or a lizard, and it certainly did not remain on the ground long enough to eat either. Presently the bird dropped close to a furze bush, and I crept up to the bush and looked over the top. The kestrel jumped and flew off, leaving a half-eaten *Argynnis aglaia* on the ground. Then I followed the bird and examined the places where it went down, and found almost every time either the mutilated remains of a *M. galatea* or of an *A. aglaia*. It seemed to have least difficulty in catching *galatea*, as, finding what it was doing, I watched it very closely and saw it miss several of the wily *aglaia*. The bird waited until the insect pitched, and then pounced down on it, and, having regard to the fact that the females were busy depositing ova, the percentage of the females killed must have been very large. I found by counting that the bird caught about thirty-six specimens in an hour, and it was hard at it for at least five hours, that is to say, the whole time I was present; and when I left, the bird was still hawking about. I have seen a kestrel at the same place on many occasions since, and similarly occupied. The bird certainly did not seem to bother itself about me, as I could have captured it in my net had I been so disposed, since it allowed me to approach within a couple of yards or so. Mr. Henry Seebohm, in his 'History of British Birds' (vol. i. p. 48), mentions frogs, moles, mice, caterpillars, lizards, earthworms, cockchafers, grasshoppers, and locusts as its usual foods. Mr. R. Bowdler Sharpe also makes statements to the same effect.—W. PARKINSON CURTIS.

URTICATING EFFECTS OF LARVÆ HAIRS.—The irritating properties contained in the hairy coats of most of the Bombyces are well known and sometimes painfully remembered by a good many collectors, possessed, like myself, with a susceptible cuticle. The cocoons have for me a particularly uncomfortable manner with them, but not until this past season did I detect a fairly clearly defined difference in the effect produced by different species. It was while examining some cocoons of *Porthesia auriflua* that I inadvertently rubbed my forearm with the fabric; almost immediately the crimson inflammation appeared, together with excessive itching, and continued for some

three hours without cessation, after which arose small red pimples, changing on the second day to white vesicles, which, after discharging a watery fluid, left an appearance as of eczema. I determined to put the matter to a further test, and, a week or two after, subjected my arm to a similar dose, with precisely similar results. Eucalyptus oil afforded relief from the smarting of the discharging vesicles, but nothing that I could find would allay the first irritation, common washing soda affording the nearest approach to relief. During the season I tried the effects of various other Bombyces, with the following results: two applications, each having similar results, were tried in each case, except *Macrothylacia rubi*. *Arctia caia*: No subsequent complication after first irritation, which lasted about half an hour and was almost immediately susceptible to common soda. *A. villica*: Similar to *A. caia*, but the hairs on the larvæ lacked the irritative properties possessed by the commoner species. *Lasiocampa (Bombyx) quercus*: Primary irritation very pronounced, but not so lasting as in the case of *P. auriflua*; the pimples changed to vesicles towards the end of the day, and by morning were dry scabs, the irritation and smarting being slight compared with that produced by the "gold tail." *Malacosoma (Bombyx) neustria*: The red inflamed patch gave much trouble, and the irritation was great, but no pimples resulted; common soda quickly reduced the itching. *Macrothylacia (Bombyx) rubi*: I decided after the first experiment not to continue operations with this species. Some of the fabric got into my eyes, and for three days I endured much discomfort; the eyes watered and became inflamed, and much difficulty was experienced in opening the lids in the morning; some of the vesicles on the arm assumed the appearance of pustules, and it was quite a week before I got rid of the effects; the primary itching was excessive and continued for ten or twelve hours, the application of various "palliatives" being useless; common soda relieved temporarily. *Callimorphia dominula*: I sacrificed most of my pupæ experimenting with these species, but beyond a slight irritation from the hairs of one partially changed larva, no material effects were experienced. *Gastropacha (Lasiocampa) quercifolia*, *Saturnia carpinii*, and *Orygia antiqua* gave no special results, but *Dasychira pudibunda* produced red patches and vesicles as in the case of *P. auriflua*, the vesicles, which were similar in appearance to those produced by the disease known as chicken-pox only much smaller, discharged on the second day and left an irritating smarting which eucalyptus oil only partially allayed; the primary itching, however, was not susceptible to either soda, potass, or borax. I was not able to procure cocoons of *P. chrysorrhæa*, but have not any doubt that the effects would have been similar to those produced by *P. auriflua*. The last-named, therefore, with *M. rubi* and *D. pudibunda*, prove to be possessed of the most irritating properties both as to larval coat and cocoon fabric. It may be that my cuticle is more susceptible than that of others, but I would like to know if any of these experiences agree with the effect produced by the same means upon others of your readers. I may mention that in most cases a piece of common washing soda, wetted and rubbed upon the surface of the irritated part until the deposit dried, was usually the most effective palliative, while eucalyptus oil was generally successful in easing the smarting

after the discharge of the vesicles.—WM. A. CARTER; Burr Villas, Bexley Heath.

PORTHESIA CHRYSORRHŒA IN ENGLAND. — With reference to Prof. Meldola's note (*ante*, p. 17), I beg to say that I have not hurriedly jumped to a conclusion with regard to Continental supply as he suggests. As a matter of fact, I have made a careful study of this insect in its haunts around the south-east coast for the last four years, from the egg state to the imago, being on the ground almost continually during the whole time, and I can safely say that we have had five "good years," during which time it has spread very rapidly, and I am not at all surprised, although pleased to hear, that it has reached as far as Wales. Now, as this insect was very plentiful about thirty years ago, and then suddenly disappeared entirely, it is very evident that after so many years' absence a fresh supply must have come from somewhere, and it is certainly very significant that it should turn up again at two or three places where direct steamers are running to and from the Continent, *viz.* Newhaven, Dover, Folkestone, and Harwich. There are at least two causes likely to bring about extermination—parasites and starvation. At Newhaven, immediately near the steamers' loading berths, this is pretty clearly shown, where the hedges on either side of the road for over a quarter of a mile present an extraordinary sight when the larvæ are nearly and some full grown, not a vestige of foliage remaining. The larvæ are everywhere, on the paths, fences, posts, and in the roadway, wandering about in search of food, and there is no doubt large numbers die from starvation, while others perish from the attacks of a fly (not a true ichneumon), very like a house fly, which "stings" the young larvæ soon after they leave the egg. When rearing hibernating larvæ, I have noticed that those that are stung wake up first and feed up much quicker, and the consequence at Newhaven is that those that are full fed when the food-plant gives out are the larvæ that are stung, and the half-fed, non-infected, larvæ no doubt perish in large numbers from lack of food. I have proved this by bringing the larvæ away in the nests when young, and also when nearly full-fed, and carrying them through to the imago stage. Notwithstanding the above, I saw hundreds of nests there a few weeks ago, and there were no signs of their diminishing. I should say that *P. chrysorrhæa* was very plentiful at Brighton, Eastbourne, Deal, and Margate, but the numbers are nothing like those at Newhaven, which reminds one of a great distributing depôt, the larvæ being easily traced along the railway hedges in the direction of London, and along the coast eastward, over Beachy Head, through Eastbourne, Pevensey, and Hastings, and westward through Rottingdean, Brighton, and Shoreham; and there is no doubt in my mind that we get considerable additions from the Continent of *chrysorrhæa*, besides other insects that come to light, and which are taken in the neighbourhood of Newhaven.—C. W. COLTHRUP; 127, Barry Road, East Dulwich, Jan. 20th, 1903.

SYMPETRUM FONSCOLOMBII IN THE ACT OF MIGRATING. — Mr. L. E. Adams has forwarded to me a male specimen of *Sympetrum fonscolombii*, which, apparently, he was fortunate enough to observe in the act of migrating. He says: "I enclose a specimen of a dragonfly that I brought

from Ghenitshesk, in the Azov, this summer (*i. e.* 1902). While at anchor there, two miles off shore, we were infested with multitudes of gnats, and these were followed by a corresponding multitude of these dragonflies (all the same species), which rapidly thinned the gnats." Those interested in British dragonflies will recollect that Mr. C. A. Briggs and his brother a few years ago met with the species (evidently immigrants and all males) at Wisley ponds, in Surrey. It is not really a British dragonfly. Mr. McLachlan has been good enough to look at the insect which has not assumed its mature ruby colouring.—W. J. LUOAS; Kingston-on-Thames.

LARVÆ OF BRITISH COLEOPHORA.—As I wish to record the life-history of all the species of the genus *Coleophora*, I should be greatly obliged if entomologists would kindly send me any cases and living larvæ which they may meet with and have to spare. I shall be most happy to do what I can in return.—HY. J. TURNER; 13, Drakefell Road, St. Catherine's Park, Hatcham, S.E.

CAPTURES AND FIELD REPORTS.

AGROTIS RIPÆ AT CHESTER.—I took a fresh and perfect specimen of this species on the night of August 13th—insects were generally delayed as to date, last season, by the cold summer—at one of the electric lamps nearest the river. Its identity was kindly established for me by Mr. C. G. Barrett. I believe this is the first record of the moth from Chester, and the interest attaching to the capture is the fact that we are twenty miles in a straight line from the coast. Stretches of sand certainly occur, midway down the river, but they are swept by the tides.—J. ARKLE; January, 1903. Since writing the above I find the food-plants of the species *Cynoglossum officinale* (hounds-tongue) and *Salsola kali* (saltwort) are to be found six miles down the river, away from Chester; the first on the Shotwick Marshes, and the second on the Dee banks. These observations appear to throw a light on the distances traversed by moths before some of them reach our electric lamps, many of which are high up above the surrounding country.—J. ARKLE; 2, George Street, Chester, Jan. 9th, 1903.

SIREX GIGAS IN WALES.—An example of this hymenopteron, which from appearances seemed to have only recently emerged, was caught resting on the window-sill of the kitchen window of our house, on June 24th, 1901, by my sister Agnes Shelley, who thinking so strange a fly might possibly be of interest to me, secured it by placing a net over it.—THOMAS J. SHELLEY; 103, King's Road, Canton, Cardiff, Glamorganshire, Jan. 20th, 1903.

HAWK-MOTH PUPATING ON SURFACE OF GROUND.—In October, 1902, through a miscalculation, I disturbed some of the larvæ of *Sphinx ligustri* that had gone down to pupate; one of these, when unearthed, refused to remain in the earth a second time, and changed on the surface. The pupa at first was of a greenish colour, very similar to the colour of the larva itself. The colour then slowly changed to a

yellowish green, and then again to a reddish hue. This last tint grew darker in colour, until the pupa had attained the ordinary aspect of the chrysalis of *S. ligustri*. The change occupied about five days altogether.—THOMAS J. SHELLEY; 103, King's Road, Canton, Cardiff, Glamorganshire, Jan. 20th, 1903.

CAPTURES AT WIMBORNE, OCTOBER, 1902.—While on a visit to Wimborne, in October last, I sugared a few trees near the house where I was staying, on four consecutive evenings (7th to 10th), and captured the following eleven species:—*Agrotis suffusa*, *Noctua c-nigrum*, *Anchocelis rufina*, *A. pistacina*, *A. litura*, *Scopelosoma satellitia*, *Xanthia ferruginea* (*circellaris*), *Epunda nigra*, *Phlogophora meticulosa*, *Hadena protea*, and *Xylina ornithopus* (*rhizolitha*). The two last-named species were also taken from tree-trunks in the daytime.—PHILIP J. BARRAUD; Bushey Heath, Herts.

BUTTERFLIES IN THE MAIDSTONE DISTRICT, 1902.—The following notes may perhaps be of some interest, giving as they do a list of the Rhopalocera to be found in this locality, and taken by myself last season (1902) within a radius of six miles around Maidstone. Considering the inclemency of the weather and poor results of other collectors, I think it a very satisfactory one:—*Pieris brassicae*, *P. rapae*, *P. napi*, *Euchloë cardamines*, *Colias hyale* (one freshly emerged specimen, June 9th); *C. edusa* (Sept. 6th), *Gonepteryx rhamni*, common; *Argynnis aglaia*, common (July 10th, Aug. 9th); *A. adippe* (Aug. 21st), common; *A. euphrosyne*, *Vanessa polychloros*, two (Aug. 9th); *V. io*, *V. urticae*, *V. atalanta*, *V. cardui*, *Melanargia galatea*, common (Aug. 9th); *Pararge megara*, *Satyrus semele*, common (Aug. 3rd, Sept. 6th); *Epinephele ianira*, *E. tithonus*, *E. hyperanthus*, *Cænonympha pamphilus*, *Thecla quercus*, *T. rubi*, *Chrysophanus phleas*, *Lycæna astrarche*, common; *L. (Cupido) minima*, *L. ægon*, fairly common (July 13th, Aug. 3rd); *L. argiolus*, *L. corydon*, common (Aug. 3rd, 20th); *L. bellargus*, *L. icarus*, *Hesperia malva*, *Thanaos tages*, *Adopæa comma* (Sept. 6th); *A. sylvanus*, *A. thaumas*. It was very noticeable how late many of the species were in making their appearance.—ARTHUR J. GOLDING; Lower Fant, Maidstone.

COLLECTING IN ROSS-SHIRE, 1902.—Last year (Entom. xxxv. 145) I recorded some of my captures in an out-of-the-way part of Ross-shire, at the head of the River Carron, and now add a few more notes about my collecting at the same place in 1902. *Lasiocampa (Bombyx) callunæ* was the most interesting species. The larvæ were in great numbers, feeding on the heather, and in places upon sallow and other plants, but I had no success in rearing them in captivity.

On Aug. 9th about one hundred larvæ were sent home to Emsworth, and other lots were sent at the beginning of September. These were kept under the most natural conditions and not crowded, yet only about two per cent. attained the pupa state. The same thing happened with those which I tried to rear on the spot in Ross-shire; nearly all died.

About Sept. 11th I first noticed a good many dead larvæ hanging to the heather-stalks on the moor, showing that even in the wild state the death-rate among them was very high.

On Sept. 23rd I began to find the cocoons on the moor. Upon

tussocks of grass or lumps of moss or lichen a brown web would be noticed, and under this, embedded in the moss, &c., was the cocoon. Of these cocoons I found about fifty or sixty before the middle of October, but I spent very little time looking for them, and no doubt hundreds might have been found by careful searching in suitable places. No young or newly hatched larvæ were observed in the autumn of 1902. On the other hand, in the autumn of 1901 I saw no full-grown or year-old larvæ, but I did see a good many young ones, about a month or two old. These observations point to the species appearing only biennially and not every year. The insect in this cold country appears to spend quite fourteen months in the larva state.

The extreme lateness of insects in 1902 was very noticeable. *Larentia casciata*, *L. didymata*, and *Cidaria populata* were all observed from Sept. 20th to 27th, and not in bad condition either. A female specimen of *L. casciata* was taken, in fair condition, on Oct. 9th. *Cænonympha davus* was also very late in 1902, while in Sutherlandshire, during August up to the 24th of that month, I noticed three or four in good condition every day, and on the 19th I took a pair *in cop*.

Returning again to my collecting in Ross-shire on the Carron water. One specimen of *Crymodes exulis* was taken at sugar on Aug. 8th; the specimen is in good condition; it resembles the form known as *assimilis*, Doubl., that I have seen from the Rannoch district, and is quite different, especially in its smaller size, from the Shetland form. I am not aware of this species having been recorded from Ross-shire before.

Sugaring at this time (beginning of August) was not at all successful, and only produced a few specimens of *Xylophasia rurea*, *X. monoglypha*, *Apamea gemina*, *Hadena adusta*, *Noctua rubi*, *N. festiva*, &c. The weather was cold, wet, and windy.—W. M. CHRISTY; Watergate, Emsworth, Hants.

NOTES FROM WALES.—Among other captures in this district during 1902 I took about twenty-five larvæ of *Dasychira fascelina*. They all pupated, and I had the pleasure of seeing sixteen emerge between July 18th and 30th. This insect appears in great profusion here some years, though its numbers vary greatly. Is it generally becoming scarcer? for I seldom see accounts of its capture, and I think it was not mentioned in the 'Entomologist' last year. Another insect which is fairly regular in its appearance here is *Charocampa porcellus*. On Oct. 4th, last year, I took a newly emerged specimen of *Grapta c-album* in some woods near here. Is not this a rather late appearance for this species? My last record of the same insect here is Sept. 1st, 1897, when a friend of mine and myself took a pair within five yards of each other, in the same clearing as my last capture.—THOS. H. COURT; Llandudno College, Llandudno, Feb. 9th, 1903.

COLLECTING IN THE NEW FOREST.—The summer (if such it may be called) of 1902 will long be remembered by entomologists as one of the most unsatisfactory and unproductive seasons in their experience. But notwithstanding the prevailing depression there are, no doubt, bright spots to be looked back to, and I, for one, have very pleasant recollec-

tions of a highly enjoyable, and by no means unprofitable, fortnight spent in the New Forest with two of my brothers. Not having visited this favourite hunting-ground since 1898, it was with great satisfaction that I once more journeyed to the old familiar haunts. Having on previous occasions made Brockenhurst our centre, we determined to settle at Lyndhurst, and arrived at that charming village on July 10th, after an uneventful journey, with the exception of the discovery, on our arrival, that a tin of treacle had broken loose in transit, and rambled round my brother's portmanteau, with effects which can be better imagined than described. Thus began our sugaring. We lost no time in getting to work, and on the evening of our arrival started out with a large acetylene lamp of seventy-candle power, which we used most of the evenings during our stay. Unfortunately, nearly the whole of the time we were troubled by that enemy of entomologists—the moon, so that it was only on two or three evenings that light had at all a fair chance. We soon found things were rather backward, and that there was little to be got in the way of imagines in the thickly wooded parts of the forest; for after netting good series of *Argynnis paphia* (including one or two var. *valesina*), *Limenitis sibylla*, and *Melanthia albicillata*, there was very little besides. Consequently, nearly the whole of our time was devoted to working the swamps and heaths, with the result that a different class of insects was obtained to those taken on our previous visits.

Like most tourists this year, we cannot give the weather very high credentials. The first three or four days of our stay were magnificent, and St. Swithin's day being the last of these, we felt there was hope of the good weather continuing. But, alas for the old tradition. St. Swithin proved to be a very worthless sort of dignitary, as the next day was pelting wet, and this was followed, during the rest of our visit, by dull and at times rainy days, succeeded by cold clear moonlight nights, about as unfavourable for light and sugar as well could be. Hard work, however, produced good results, the following insects being taken in the swamps by day:—*Argynnis adippe*, *Zygana trifolii*, very abundant, and yielding some good pale and confluent forms. *Eutemonia russula*, most active; we met with it before sunrise, at all hours of the day, and it came dashing around our lamp at night. Both males and females were taken, and from the latter several batches of ova were obtained. *Drepana falcata* was occasionally noticed, and *Hydrelia uncula* flew in fair numbers when the sun shone, as also an occasional *Hyria muricata*. On the 14th we got up before sunrise and sallied out to seek this insect at its natural time of flight, but without success, and we came to the conclusion that it was not yet out. This proved to be the case, as by adopting similar tactics near Brockenhurst, on the 25th, we each obtained a long and variable series of this beautiful little insect, one of my prime favourites. It flew briskly among bog-myrtle, commencing its flight precisely at six, and continuing on the wing about three-quarters of an hour, after which it was very difficult to find a single specimen. By tapping the trunks of saplings and trees of small growth we obtained *Erastria fuscata*, *Cleora glabraria*, *Minoa murinata*, *Eucosmia undulata*, *Eupisteria heparata* (in numbers), *Ephyra orbicularia* (one only, very worn), and both sexes of *Bupalus piniaria*. *Acidalia immutata* was also noticed in the swamps, and more frequently

by day than by night. Day-work on the heaths produced *Lycæna ægon*, *Anarta myrtilli*, *Euclidia glyphica*, *Gnophos obscurata*, *Selidosema ericetaria*, *Acidalia straminata*, and *Aspilates strigillaria*. Several specimens of *Heliothis dipsacea* were seen on the 14th, but not captured.

Sugar proved to be almost entirely a blank in the thicker parts of the forest, the only insects taken being *Nola strigula*, *Dipterygia scabriuscula*, and *Gonophora derasa*. We succeeded better in the swamps by sugaring a post and rail-fence, and took the following:—*Thyatira batis*, *Gonophora derasa*, *Acronycta leporina*, *A. ligustri*, *Leucania impudens* (extremely abundant), *L. impura*, *Rusina tenebrosa*, *Agrotis strigula*, *Noctua festiva*, *Euplexia lucipara*, *Aplecta nebulosa*, *Hadena contigua*, *Gonoptera libatrix*, and *Mania maura*.

Network at dusk proved to be by far the most profitable method. We fell in with *Nudaria senex* in good numbers, but its flight was greatly affected by climatic conditions. On the 14th the weather was perfect for it, and it appeared in hundreds at early dusk, and again, later on, at light; other insects were *Lithosia mesomella* (in abundance), *Hepialus hectus*, *Lithosia quadra* (one specimen on our last evening), *Cymatophora duplaris*, *Thyatira batis*, *Erastria fuscula*, *Boarmia roboraria*, *Phorodesma bajularia*, *Lobophora sexalata* and *Collix sparsata* (both in plenty round the salallows at night), *Eucosmia undulata*, *Iodis lactearia*, *Pseudoterpna pruinata*, *Melanthia albicillata*, *M. rubiginata*, *Ligdia adustata*, *Eupisteria heparata*, and *Cidaria dotata*.

On the one or two evenings towards the close of our stay, when the moon was obscured by clouds, light was very profitable, and in one evening about 150 specimens were taken at the lamp. These included *Euthemonia russula*, *Lithosia mesomella*, *Calligenia miniata*, *Nudaria senex*, *Phalera bucephala*, *Odonestis potatoria*, *Malacosoma neustria*, *Nola strigula*, *N. cucullatella*, *Leucania impudens*, *L. impura*, *Agrotis strigula*, *Acidalia emarginata*, *A. scutulata*, *A. straminata*, *Epione apiciaria*, *Oura-ptyx sambucaria*, *Tephrosia crepuscularia*, *Cleora lichenaria*, and *Geometra papilionaria*. This beautiful insect looked most graceful, as it came with sailing flight to the lamp. It flew about 11 p.m., but when disturbed earlier in the evening its movements were so lightning-like that it was impossible to capture it. *Lobophora sexalata* again put in an appearance, while *Hypsipetes elutata* and its congener *impluviata* were both very abundant, and yielded some good forms: *Lomaspilis marginata* (very variable), *Hemithea strigata*, *Boarmia repandata* and *gemmaria*, *Larentia pectinitaria*, *Melanthia albicillata* (one), *Pachynemia hippocastanaria*, and *Rivula sericealis*. On this occasion we were up all night, being out with the lamp until about 2 a.m., and then (after a good supper and an examination of our catch) going to Brockenhurst for *Hyria muricata*. On the 21st we went on pilgrimage, to renew our acquaintance with the shrine of *Hesperia actæon* at Swanage, and, notwithstanding a very dull day, we each obtained a fair series, but the specimens were somewhat worn, and the species was evidently getting over. *Melanargia galatea* was also common on the cliffs, and several specimens of *Cledeobia angustalis* were taken. We cycled to Ringwood one evening, on the chance of a belated *Emydia cribrum*. In this we were unsuccessful, but were rewarded by each obtaining a good series of *Pachynemia hippocastanaria*. On the road between Lyndhurst and Ringwood we encountered Mr. J. H. Fowler, who very kindly placed

two hours at our disposal, to look at his magnificent series of *E. cribrum* vars. of *Callimorpha dominula*, and other interesting insects.

We did but little larva-beating or searching, but the following were noticed:—*Peridea trepida*, *Notodonta camelina*, *Psilura monacha*, *Euchelia jacobææ*, *Macrothylacia (Bombyx) rubi*, *Taniocampa stabilis*, *Plusia gamma*, *Tephrosia consonaria*, *Iodis lactearia*, and (at Swanage) *Nonagria typhæ*.

We left on the 26th, with many regrets, having had a most enjoyable hard-working holiday. — HUGH J. VINALL; 3, Priory Terrace, Lewes.

SOCIETIES.

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.—By the courtesy of the Warrington Corporation the usual monthly meeting was held in the Museum, Warrington, on December 8th, Mr. William Webster, of St. Helen's, in the chair. Messrs. J. F. Dutton (Helsby) and J. R. le B. Tomlin (Chester) were duly elected members of the Society.—Mr. Alfred J. Jolley read an instructive paper on "Larval Forms, a Study for the Doctrine of Descent," in which he portrayed the magnitude of the difficulties with which the student had to contend, and the need for caution in dealing with questions of evolution in those animals that passed through complete metamorphoses, since in many cases the life-history of the individual cannot be accepted as representing the life-history of the race. A hearty vote of thanks having been accorded the lecturer for his interesting and exhaustive discourse, Mr. F. N. Pierce contributed a communication "On the Specific Differences between *Lithosia sericea*, *L. complana*, and *L. complanula*," in which he recorded the results of his investigation on the genitalia of the Lithosidæ. Unfortunately, the results of his research as regards the first two were of a negative character, inasmuch as the genitalia were identical in both species; but as *L. pygmæola* was also similar to these, and no one doubted the claim of the latter to specific rank, he was of opinion that as the differences in colour, habitat, larvæ, &c., were so constant, until the one had been bred from eggs laid by the other, *L. sericea* and *L. complana* must stand as distinct species. The notes were illustrated by the author's preparations, thrown on the screen by the micro-lantern, drawings of the genitalia, and the insects themselves. Mr. Collins, in discussing the paper, confirmed Mr. Pierce's conjecture as to moisture being responsible for the production of melanism in the Lithosidæ. The following exhibits were examined:—A fine collection of Transvaal Lepidoptera, ranging from the Sphinges to the Deltoides, by Captain B. Fairclough; Lithosidæ, by Mr. F. N. Pierce; British Longicorns, including *Strangalia aurulenta*, *Saperda scalaris*, and *Leptura scutellata*, by Messrs. J. R. le B. Tomlin and J. F. Dutton; some remarkably light varieties of *Abraxas grossulariata* and *Thera firmata*, from Delamere, by Mr. J. Womersley; gall-making insects and specimens of their work, by Mr. J. Deane; melanic forms of *Triphana orbona* from Lewis, Elgin, &c., one specimen with dark hind wings lacking the marginal band being exceptionally interesting, by Mr. B. H. Crabtree; *Caradrina ambigua*, *Aporophyla (Epunda) nigra*, &c.,

by Mr. R. Tait, jun.; *Vanessa urtica*, varieties, by Mr. T. Wright; insects found in timber, by Mr. W. Mountford; Lepidoptera varieties, by Mr. B. Prince; British Bembidiidæ, by Mr. R. Wilding; and beautiful specimens of *Dasyampa rubiginea*, *Plusia moneta*, &c., by Mr. J. Collins.

Correction.—I regret that in the account of my exhibit at the Lancashire and Cheshire Entomological Society's October meeting Mr. W. H. Harwood's Colchester earwig should have been given as *Forficula pubescens* (Serv.) (Entom. xxxv. 331). It should have appeared *F. lesnei* (Fin.). The error was mine,—E. J. B. Sopp.

TIFFINS' SCHOOL NATURAL HISTORY SOCIETY.—We have received a Report of the proceedings of this Society for the year 1902. The Society is connected with Tiffins' Endowed Schools, Kingston-on-Thames, and is affiliated with the South-Eastern Union of Scientific Societies. The President is Mr. W. J. Lucas, B.A.; the Treasurer, Mr. C. J. Grist, M.A.; and the Hon. Secretary, R. H. Carter. The business transacted during the year appears to have been extensive and varied. A number of lectures were delivered, and most of these were illustrated by photos and micro-photographs projected on the screen. Among the lectures was one on "Insects" by the President. Excursions were made during the season to various Surrey localities for the purpose of collecting and studying objects of Natural History, and it may be added that several of the members are greatly interested in Entomology.

RECENT LITERATURE.

L. MELICHAR. Monographie der Acanaloniiden und Flatiden (Homoptera). "Ann. Naturh. Hofmuseums Wien, Band xvi. pp. 178-258 (June 14th, 1902) and Band xvii. pp. 1-253 (1902). Plates i.-ix.

THIS goodly monograph of 334 pages completes the revision of the Pœkillopterinae (sens. lat.), the "Ricaniiden" having been surveyed previously.* It is one of the most important Rhynchotal works that have appeared for some time, and students of that neglected order will be proportionately grateful to the author. I think, however, that an introduction, dealing with the salient points in the morphology of these insects and summarizing their geographical distribution and so forth, would have enhanced its value.

The "Acanaloniidæ"† are distinguished by the absence of cross nervures on the costal margin of the tegmina and of granules on the clavus; the posterior tibiæ are spineless. The "Flatidæ" (subf.) have cross nervures in the clearly marked-off costal membrane; the clavus is always more or less granulate, and the posterior tibiæ are furnished with one, two, or three spines each.

Six Acanaloniid genera are recognized, with 26 species; of these, 2 genera and 6 species are new. These 26 species are all American, with one exception—the African *Parathiscia conjugata*.

* See 'Entomologist,' 1899, p. 263.

† Dr. Melichar unfortunately follows Lethierry and Severin in employing identical horismology for families and subfamilies, a very confusing practice.

Of the "Flatidæ," 85 genera are recorded, with 497 valid and 35 doubtful species; of these, 42 genera and 255 species are described as new. It may be noted that of these, 32 genera are erected with only a single species apiece; on the other hand, *Elidiptera* (= *Flatoides*) is credited with 91 and *Ormenis* with 77 species. The genera, as founded or confirmed by Melichar, appear to be well defined geographically. Roughly analysed, there are 25 genera confined to the Oriental Region,* 20 to the Æthiopian Region,† 11 to Central and South America and the Antilles, 7 to Australia and Polynesia, 6 to the Palæarctic Region,‡ 6 of mixed distribution or more or less cosmopolitan. Only 8 genera, with 17 species, have been described from Continental Australia, doubtless a small proportion. Of the 20 exclusively Æthiopian genera, 8 are confined to Madagascar.

While according every praise to the descriptions, analytical tables of genera and species, and to the excellent plates with figures of 179 species, I must take exception to certain details of Dr. Melichar's nomenclature. The principal mistakes or differences of opinion which I have noted are as follows:—

Band xvi.—P. 185. *Acanalonia umbraculata* (Fabr.) = *florea*, Stål. I know of no reason for sinking Fabricius' name. The date of "Vet. Akad. Verh. viii. p. 86," is, of course, 1869, not 1835.

P. 203. Stål was quite correct in erecting a new genus *Phromnia* for *floccosa* and its allies, the type of *Flata* having been fixed by Fabricius in 1803 as *ocellata*.

P. 218. *Cerynia*, Stål, K. Svenska Vetensk. Akad. Handl. iii. no. 6, p. 68 (1861).

P. 220. *Cerynia maria* var. *rosea*, Melich. 1902, = var. *rosea*, Atkinson, 1886, J. Asiat. Soc. Bengal, lv. pt. 2, p. 64; from Sikkim.

P. 222. *Cenestra*, Stål, K. Svenska Vetensk. Akad. Handl. iii. no. 6, p. 68 (1861).

P. 223. *Paramelicharia* n. n. = *Copsyrna*, Melichar (nec Stål typ.). Type *maculata* (Guér.).

P. 224. *Copsyrna*, Stål, K. Svenska Vet. Akad. iii. no. 6, p. 69, = *Bythopsyrna* Melich. Type *tineoides* (Oliv.).

Melichar fixes the type of *Copsyrna* as *maculata*. Unfortunately, six months previously I had fixed it as *tineoides* (Oliv.), the other original species, the only one I was acquainted with. My paper in the J. Bombay Nat. Hist. Soc. was (p. 54) published Jan. 24, 1902; Melichar's Band xvi. June 17th, 1902.

P. 251. *Pseudoflata postica* (Spin. 1839) = *nigricornis*, Guér. 1843 (not 1838).

Band xvii.—P. 19. *Flata*, Fabr. typ. = *Cryptoflata*, Melichar (see my remarks on *Phromnia*).

P. 30. *Carthæa*; type *caudata*, Stål, Svensk. Vet. iii. p. 68, not *emortua*, as indicated by Melichar.

P. 32. *C. folium-ambulans* (de Geer) = *emortua* (Fabr.).

Pp. 33-4. *Ormenis mendax*, Mel., is stated to come from "Moupin," and Melichar adds, "Dieser Ort scheint in Centralafrika im Congo-

* That is, including Japan, excluding New Guinea, &c.

† Including Madagascar.

‡ Excluding Japan, whose Fulgorid fauna seems to be more Oriental.

gebiete zu liegen (Mupe).” Moupin, however, is well known through the researches of the late Père David,* and is one of the most interesting districts of the world, at a great elevation, on the other side of the Snowy Mountains of China (31° N., 101° E.), near Makin on the Yalong source of the Yang-tse-Kiang.

Pp. 58 & 107.—*Colgar*, Mel., is not equivalent to *Colgar*, Kirk. In founding this genus, I made it homotypical with the preoccupied genus *Atella*, Stål, stating the type to be *C. peracuta* (Walker). As this was one of Stål's original species (1866, Berlin. Ent. Zeit. p. 394), and as the genotype had not been fixed previously, my application of it cannot rightly be disputed. Walker's *peracuta* does not figure, however, in Melichar's idea of *Colgar*, but in his application of *Cromna*, Walker. *Cromna*, Walk., however, does not equal, in a restricted sense, *Cromna*, Mel., for the only species, originally included by Walker, is not found in Melichar's genus. The following synonymy will illuminate the puzzle:—

1. *Phyllyphanta*, Am. & Serv., 1843 = *Cromna*, Walker, 1857.
Type of the former, *P. producta* (Spinola). Type of the latter, *C. acutipennis*, Walker.
2. *Colgar*, Kirk., 1900 = *Atella*, Stål., 1866 (preocc.) = *Cromna*, Melich., 1902. Type, *peracuta* (Walker).
3. *Neomelicharia*, n. n. = *Colgar*, Mel., 1902, nec Kirk., 1900.
Type, *cruentata* (Fabr.).

P. 173.—*Elidiptera*, Spin., 1839 = *Flatoides*, 1843 = *Helicoptera*, Am. & Serv., 1843.

P. 173.—*Cerfennia*, Stål. (not *Cerfenia*). The original reference to Spinola's 1839 genera is *Revue Zool.* pp. 199–206.

The genus *Hansenia* should be credited to me (as it is in the index), and not to Melichar. My manuscript was sent in to the Bombay Nat. Hist. Soc. early in 1900 (not at the end of 1901, as printed), but was not published till January 24th, 1902. Melichar's monograph was issued subsequently to this. Melichar has, however, unfortunately followed my mistake of identifying the *Paciloptera glauca* of Kirby with *P. pulverulenta* of Guérin. The two have nothing in common, and while the former is from Ceylon, the latter is from Mexico, and is rightly placed in *Ormenis* elsewhere in the monograph. The synonymy of *Hansenia glauca* will be as follows:—

Genus *HANSENIA*, Kirk., 1902, *Journ. Bombay Soc.* p. 53; Melich., 1902, *Ann. Wien. Bd.* xvi. pp. 195 & 228.

Type, *H. glauca* (Kirby).

Paciloptera glauca, Kirby, 1891, *J. L. S.* xxiv. p. 154. *Hansenia pulverulenta*, Kirk., p. 54; Mel., p. 229 (nec *Paciloptera pulverulenta*, Guérin).

These discrepancies are, however, comparatively slight, and the fact remains that for the first time we have lucid descriptions of all the species—except some of the Walkerian—of which about one-half are described as new. It is hoped that a considerable stimulus will thus be given to the study of these beautiful insects.

G. W. KIRKALDY.

* I am indebted to Dr. Sharp for refreshing my memory on this point.

The Lepidoptera of the British Islands. By CHARLES G. BARRETT, F.E.S.
Vol. VIII. 8vo. Pp. 1-431. London: Lovell Reeve & Co.
1902.

THE present volume concludes the Acidaliidæ and discusses nearly the whole of the genera in the Larentidæ. *Eupithecia*, *Eubolia*, *Meso-type*, and *Tanagra* still remain to be dealt with, and these will probably occupy half of the next volume.

That the Acidalids sadly need generic revision will be generally admitted, but our author has not attempted much in this direction. The adoption of *Ania*, Steph., for "*Acidalia*" *emarginata*, L., seems to be valid, but the employment of *Bradyepetes* for *amataria*, and of *Timandra* for *strigilata*, Hb., *emutaria*, Hb., and *imitaria*, Hb., is perhaps open to objection. *Amataria* (*amata*), L., is by most authors considered the type of *Timandra*, Dup. (1829) = *Bradyepetes*, Steph. (1831). The three species here referred to *Timandra* are included by Meyrick in *Leptomeris*, Hb., which Hampson merges in the Boarmid genus *Deilinia*, Hb.; while, to complicate things still further, Prout uses *Erastria* for *amataria*.

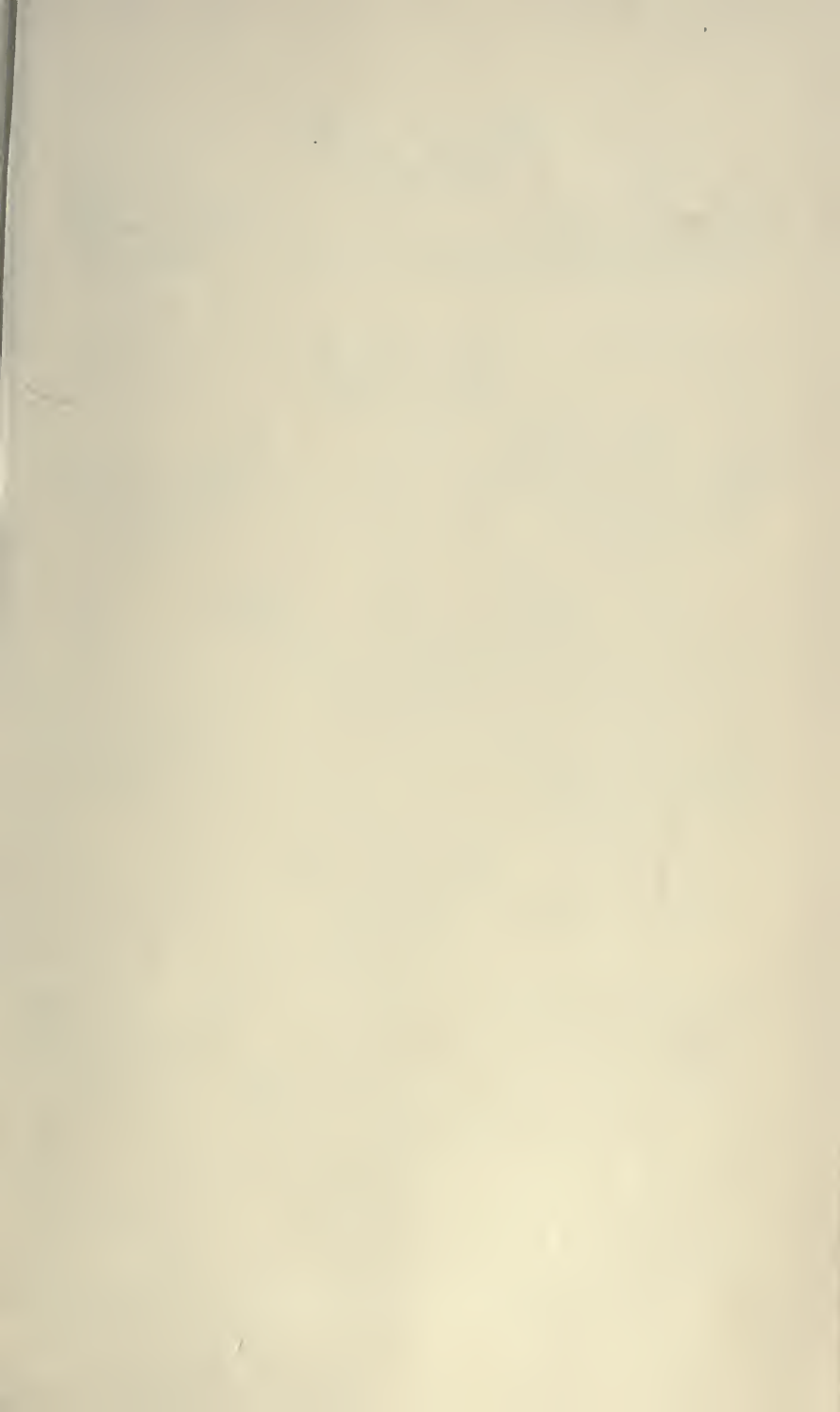
As in previous volumes, the remarks on habits, life-history, variation, and distribution are very complete, and these are matters with which the majority of those who are interested in the Lepidoptera of our own country are more immediately concerned, than with the ultraism of the newer entomology.

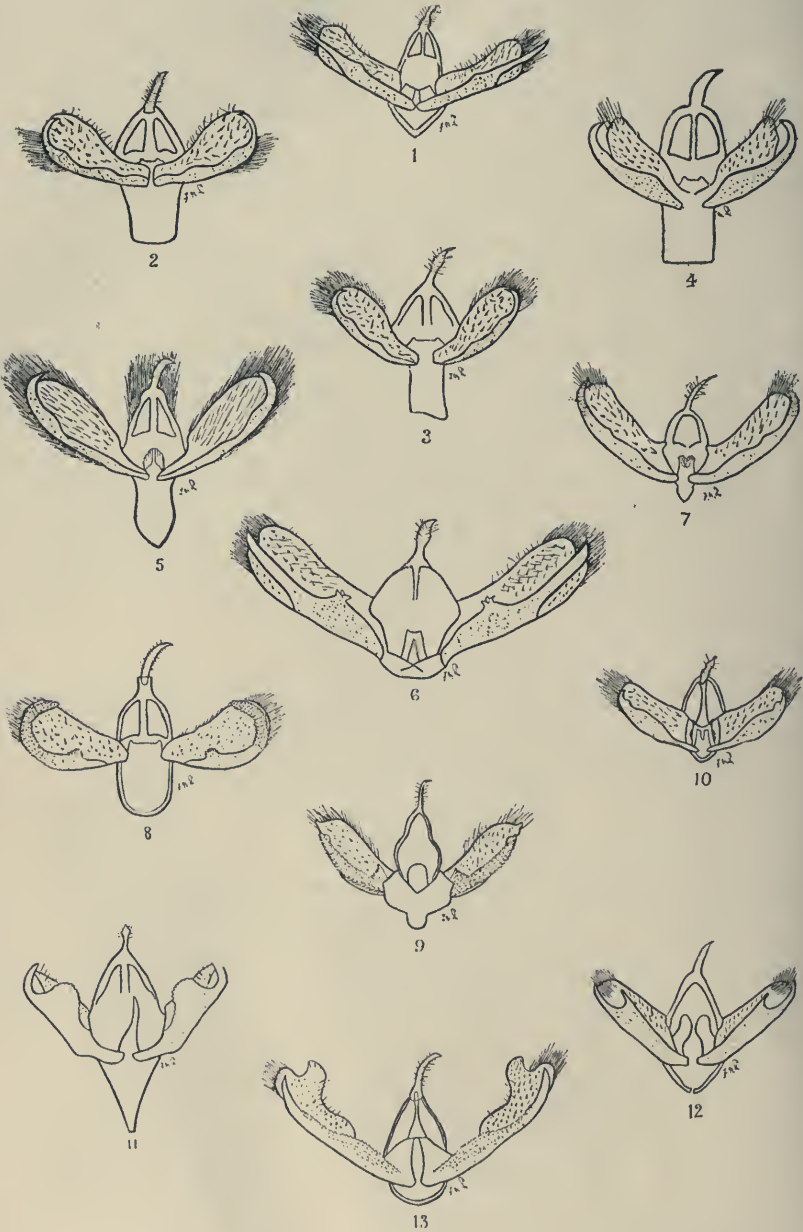
A Catalogue of the Lepidoptera of Northumberland, Durham, and Newcastle-upon-Tyne. By JOHN ROBSON, F.E.S. Pt. II. 8vo. Pp. 196-318. With Introduction, pp. i-xvi, and Title-pages to Pts. I. & II. London: Williams & Norgate. Newcastle-upon-Tyne: F. W. Dodsworth. December, 1902.

THE second Part of this excellent Catalogue, which treats of the "Geometrina," is in every way equal in merit to Part I., to which we had the pleasure of directing attention in 1899 (Entom. xxxii. 232). As we then observed, this is not simply a list of the species found in the area dealt with, but each entry is accompanied by useful notes; and in cases where doubt existed concerning the occurrence of species within the limits of the area, the author has very carefully investigated the matter, and retained or expunged such species according to the nature of the evidence obtained.

In the first part of the Catalogue the arrangement adopted by Barrett in 'Lepidoptera of the British Islands' was followed, but in the instalment before us the arrangement is that of Stainton's 'Manual.' This is certainly unfortunate, but should not lead to confusion.

We trust that the author may very shortly be able to publish the "Micro" portion of his work.





West, Newman imp.

Structure of Genitalia in Lithosidæ.

THE ENTOMOLOGIST

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[No. 479.]

SPECIFIC DIFFERENCES IN LITHOSIDÆ, AS DETERMINED BY STRUCTURE OF GENITALIA.*

By F. N. PIERCE, F.E.S.

PLATE I.

Lithosia sericea, Gregson, was first described by my old friend C. S. Gregson, in a paper read before the Old Northern Entomological Society on September 29th, 1860, and printed in the 'Entomologists' Weekly Intelligencer,' ix. p. 30, in which he points out the difference between it, *Lithosia complana*, and *L. complanula*; Guenée (Ann. Ent. Soc. France, 1861, 4th series, vol. i. p. 50) redescribes it under the name *molybdeola*. Both entomologists take the shape and markings of the wings as sufficient to constitute a new species, Guenée observing that the distinction of the species must depend on the discovery of the larva.

Sericea is peculiar to the Lancashire mosses, and as it has not been found elsewhere, certain doubts have from time to time been thrown on it being a good species.

Buckler and Hellins (vol. iii. p. 20) appear to supply the confirmation required by Guenée and state that the larva of *sericea* differs from *complana* in the subdorsal spots having no roundness whatever in their shape, but narrowish oblong, somewhat wedge-shaped marks; also that while in *complana* the spiracular region is occupied by one broader rust-coloured line, in *sericea* there are first a fine line of pale grey, then a line of the ground colour, and then a narrower line of the rust colour. But even this does not appear to satisfy everyone on their distinctiveness, for Meyrick, in his 'Handbook of British Lepidoptera,' page 27, states of *sericea*: "It is uncertain whether this is anything

* Read before the Lancashire and Cheshire Entomological Society, Dec. 6th, 1902.

more than a local form of *L. complana*; the larvæ are practically identical." *

Mr. Barrett dismisses it as follows: "These Lancashire specimens were at one time supposed to form a distinct species, described under the names of *L. molybdeola*, Guenée, and *L. sericea*, Gregson, but no line of distinction appears to exist."

Finally, in the 'Record,' Mr. Prout protests against Mr. Tutt recording *sericea* as a var. of *complanata*; he says: "So long ago as 1867 Speyer pointed out structural differences, not only in the shape of the wings, but also in the size of the costal tuft of scales on the under side of the fore wings, not to mention its colour, &c. Until his observations have been seriously challenged, and the characters in question proved inconstant, it seems to me quite unjustifiable to sink *sericea* as a variety."

To this Mr. Tutt replied:—

"It has always been one of the greatest puzzles to me why *Lithosia sericea* should ever have been considered distinct from *complanata*. To those who know *complanata* over a fair part of its area of distribution there is no need to enter into details of the great difference in size, and to a less extent in wing-shape, due probably to a somewhat fuller development accompanying the larger size that exists in specimens of this species from various localities. Added to this, one finds, as a rare aberration, occasional specimens of *complanata* in Kent, with the superficial appearance of *sericea* very strongly developed. With regard to Speyer's differentiation of the size of the costal tuft of scales I know nothing, nor have I at present time to investigate; but the thought arises whether this is more than a slight specialization due to the same conditions of environment that have produced what to me seems nothing more than a well-marked local race of a very widely distributed species. Cannot a parallel examination of eggs and larvæ, both obtainable in Britain, be made for specific differences, if these exist? Is not the material available for a comparison of the genitalia? At present I am a sceptic as to the specific claims of *sericea*, but my scepticism perhaps is based on very insufficient grounds. There is, I believe, in the Ent. Weekly Intelligencer, a trenchant criticism of Speyer's remarks by one of the Lancashire collectors, who took the insect freely on the mosses in the fifties."

It is interesting to note that Prout says Speyer pointed out the differences in 1867, whereas Tutt says there is a criticism of this in the 'Intelligencer,' the last volume of which was published in 1861, so that the criticism was given six years before the gentlemen wrote the article—which shows the cleverness of the old Lancashire collectors!

* Meyrick is quite unreliable: he puts *Oporabia autumnata*, *filigrammaria*, and *dilutata* together as one species, also *Cidaria russata* and *immanata*, whose times of appearance, hybernation of pupa, &c., and structure of genitalia, must entitle them to be considered separate species.—F. N. P.

Such, then, is our knowledge. It would be interesting to know why Mr. Barrett puts Guenée's name before Gregson's, and also why he is so dogmatic in using the word "supposed;" it evidently is not accepted, by Mr. Tutt's remarks made after Mr. Barrett's statement.

I had long wished to examine the structure of the genitalia, and very gladly accepted Mr. G. O. Day's kind offer to send me worn males. These I have very carefully examined and compared, but, alas! the result is a negative one. I can see no form of difference between the two. Some may be inclined to say: "Why, this at once settles the point; the species has been doubted all the way through; now the genitalia being identical confirms the well-grounded suspicion." But it is not so, nor is it wise to jump to conclusions from negative results. During my investigations I have repeatedly found very closely connected species possess organs so similar that I have found it impossible to distinguish any difference, although the imagines may have an abundant difference in wing-markings and breed true to type; also that the larvæ may differ. One point of differentiation is not sufficient, and although I regret that I have failed to decide this knotty question by genitalia, it will want stronger evidence than has been brought forward in the bare statements of the writers quoted, to convince me that *sericea* is identical with *complana*.

I shall presently show that there is practically no structural difference between the genitalia of *complana*, *sericea*, and *pygmaeola*; and as all are agreed that the latter is a distinct species from either of the former, although having similar genitalia, therefore there is no proof of the identity of *complana* and *sericea* because the genitalia in these two species agree.

Whether the genitalia may be used exclusively for classification or not, it seems to me, will depend upon how far it aids other means. In this paper I do not intend to attempt this, but give the results as I find them, and leave it for others to make what use they like of them. The method I have adopted is to take the simplest form as the start, and gradually lead up to the highest or most complicated form. The portions I compare consist of the harpes, situated at either side of the body; the claspers, which are the hooks inside the harpes; the uncus, a large spine on the dorsal portion which projects between the harpes and which, as many of the preparations are flattened, is bent sideways; and, lastly, a most important organ connecting the base of the harpes which I call the juxta.

Lithosia mesomella (Fig. 1).—Harpes are squared at the apex; the claspers are broad for three parts, then narrowed off to a chitinous point; the uncus is slightly contracted near the tip, the juxta is wide, bent towards the centre, and corners without the acute angle.

Lithosia complana (Fig. 2).—The harpe is rounded; the clasper is broad for three quarter parts, then narrowed off to a chitinous point. The uncus is parallel, and the juxta is fairly wide with two acute angles on the upper surface, one at each corner.

Lithosia sericea (Fig. 3).—The harpe is rounded, the clasper is broad for three quarter parts, then narrowed off to a chitinous point. The uncus is parallel; the juxta is a little narrower, with two acute angles on the upper surface, one at each corner, smaller than in the preceding species.

Lithosia pygmaeola (Fig. 4).—The harpe is rounded; the clasper is broad for three-quarter parts, then narrowed off to a chitinous point. The uncus is parallel, much broader than preceding species. The juxta has the two acute angles similar to the above species, but again smaller. With the exception of *pygmaeola* being smaller than *sericea*, and the latter smaller than *complanata*, these three species are so closely similar that I do not think I could tell the species by examination of the genitalia alone, without comparison in size.

Lithosia caniola (Fig. 5).—The harpe rounded; the clasper broad for three-quarter parts, then narrowed to a chitinous point; the uncus slightly thickened in the middle. The juxta is broad and curved, highest in the centre, gradually narrowing off and giving the appearance of steps.

Lithosia quadra (Fig. 6).—Harpe rounded and indented at the apex; the clasper sharply broadened out for one-third, where there is a little knot of spines, then as suddenly narrows into the chitinous point. The uncus strong, slightly narrower at the base. The juxta I have been unable to quite make out, but it appears to be bent over and divided into two round lobes.

Lithosia aureola (Fig. 7).—The harpe rounded; the clasper broad at the base for about a half, when it narrows off to the chitinous point, which is file-like for a small portion of the tip. The uncus is long and tapered. The juxta is bifurcated and lobed, the lobes being furnished with file-like teeth.

Lithosia complanula (Fig. 8).—The harpe is rounded; the clasper broad for about one-third, when there is a little knot of short file-like teeth, and just beyond narrows to the chitinous point, which is clothed with the file-like teeth; the uncus long and parallel, and the juxta is squarely angulated with acute angles.

Lithosia muscerda (Fig. 9).—The harpe is bluntly pointed with a projecting blunt tooth on the lower apex; the clasper broadens out for a little over a third, when it becomes clothed with the file-like teeth and narrows off to a point. The uncus is long and slender, but not acutely tapered until near the tip; the juxta is rounded.

Lithosia helveola (Fig. 10).—The harpe rounded; the clasper is parallel for three quarter parts, when it narrows, then widens

to narrow again to a sharp tip, beak-like. The uncus is short, wider near the apex and pointed, and the juxta is deeply indented in the centre, the tips being long-pointed.

Lithosia griseola (Fig. 11).—The harpes are pointed; the clasper rapidly broadens out, when it takes a round turn; toothed at the edge of the rounded portion, falling almost straight down to the chitinous point; the uncus is elegantly shaped upwards, when it broadens out and is abruptly angulated to a point. The juxta is produced into a long chitinous spine about half as long as the harpes.

Lithosia rubicollis (Fig 12).—The harpe is rounded; the clasper runs up fairly parallel to about three-quarters, when it takes a backward curve, leaving a deeply emarginate curve, and then makes the chitinous point. The uncus is very long and tapered, and the juxta is bifurcated into two round lobes.

Lithosia miniata (Fig. 13).—The harpe broadens out and becomes deeply emarginate at the apex; the claspers about a third up become thickly clothed with fine spines up to about three-quarters, when it makes its chitinous point; the uncus is long and parallel, and the juxta is not distinguishable in my preparation, but this is immaterial on account of the distinctness of the harpes and claspers.

With regard to the tuft of scales on the under side of the costa, which I believe is referred to by Speyer, whose article I have not seen, although I have searched through the 'Entomologists' Intelligencer' for the criticism mentioned by Tutt. This tuft of scales lies under the yellow stripe, and is, as far as I can see, about the same length in good specimens of *complanata* and *sericea*, but is very different in colour, being yellow, same as the costa in *complanata*, and silky grey in *sericea*.

This brings me to the shape of the wing, which in *sericea* is said to be narrower than in *complanata*. I cannot agree that this is so, for in all the specimens of *sericea* that I have seen the fore wings have not been fully flattened out in setting, and as they are apparently inclined to fold over on the costa, the collector does not appear to have taken sufficient care in setting, and thus the costa is in each case bent over, giving an appearance of narrowness to the wing; but may there not be some real reason for this undevelopment? The species is known to run smaller as a rule, and of course raises the question of unsuitability of food, environment, &c., which, if carried to an extreme extent, may produce *pygmæola*.

I think it is now generally accepted that dampness is one cause of melanism. One of the differences given is that the hind wings are darker. It has been pointed out by Mr. Joseph Collins, of Warrington, who rediscovered the species, that since his acquaintance with it some of the localities have been drained, with the natural result that the darkness of the hind wings has to

a certain extent disappeared, or, at any rate, is not so marked as in old specimens, but that the silkiness of the wings (from which Gregson named the species *sericea*) is still the same. It would be interesting to know if Mr. Tutt's Kent specimens occasionally show this silkiness, or does the "superficial appearance" he speaks about only belong to the darkening of the hind wing?

To sum up, I give the arguments in favour of *sericea* being a variety on the one hand, and a good species on the other:—

FOR BEING A VARIETY.

Peculiar to mosses.
Similar specimens found in Kent
(Tutt).
Dampness producing melanism.

FOR BEING A SPECIES.

Shape of fore wing.
Colour of costal tuft.
Difference in larvæ.
Colour of hind wings.
Silkiness of fore wings.
Genitalia—because *pygmæola* is
also similar to it and *com-*
plana.

With these points I leave the matter. I do not think the variety theory has at all been proved. I am therefore of opinion that until eggs of *sericea* produce undoubted *complana*, and *vice versa*, old Gregson's name and differentiation will stand good, and that we have two species in *Lithosia complana* and *Lithosia sericea*.

The Elms, Dingle, Liverpool.

EXPLANATION OF PLATE.

- | | |
|---|--|
| 1. <i>Cybosia</i> (<i>Lithosia</i>) <i>mesomella</i> . | 7. <i>Lithosia aurcola</i> . |
| 2. <i>Lithosia complana</i> . | 8. <i>Lithosia complanula</i> . |
| 3. <i>Lithosia sericea</i> . | 9. <i>Pelosia</i> (L.) <i>muscerda</i> . |
| 4. <i>Lithosia pygmæola</i> . | 10. <i>Lithosia helveola</i> . |
| 5. <i>Lithosia caniola</i> . | 11. <i>Lithosia griseola</i> . |
| 6. <i>Cænistis</i> (L.) <i>quadra</i> . | 12. <i>Gnophria</i> (L.) <i>rubicollis</i> . |
| 13. <i>Mitochrista</i> (<i>Calligenia</i>) <i>miniata</i> . | |

[The editor is responsible for generic names in the Explanation of Plate.]

SOME BRITISH FORMS OF *MELITÆA AURINIA*.

BY PERCY E. FREKE, F.E.S.

I HAVE been much perplexed by this extremely variable species, and I have found my first efforts to learn something definite about its many forms have only led to greater perplexity and confusion.

On looking over a mass of material from many localities, and trying to make it fit in with some of our leading recognized arrangements, Mr. Tutt's or Mr. Kane's for instance, I have

found only too often my attempts have left my comprehension of the subject in a worse state than ever. In this I am not alone. Some of my friends, men too of some experience, have very indefinite opinions on the subject, or no opinion at all. I therefore set about systematically studying the markings in detail, following each spot or blotch through its variations, and endeavouring to arrive thereby at a more definite understanding of the classification and distribution of the species. My experience and material, however, are very limited compared with those of many others, and I have therefore set down the following notes in the hope that someone who has more thoroughly mastered the subject may be able to help me, and others like me, to a better comprehension of it.

Melitæa aurinia (Rott.).—Upper side. Fore wings.—From the costal margin to the costal nervure is the dark blackish brown which forms the boundaries of most of the colour spaces. This I speak of hereafter as dark. Here it is more or less flecked with ochreous or light scales.

The inner margin to the first nervure is dark throughout its whole extent. The base of the wing is dark. Beyond that the discoidal cell is divided into four most irregularly shaped areas or spots, of which the first and third are ochreous, and the second and fourth fulvous red. Another fulvous, acutely triangular spot occupies the space at the junction of the second nervure with the discoidal cell.

Beyond the dark base of the wing, between the first and second nervures, are four irregular spots, corresponding in colour to the four in the discoidal cell, and which with them might almost be said to form four bands across the base of the wing, were it not for their very irregular shape, and that the fourth band is broken by the triangular spot before referred to.

Outside the discoidal cell—towards the hind margin—is a double ochreous row (the first row), separated and bounded by dark bands, and further broken up by the dark nervures into a double series of elongated, somewhat quadrangular, ochreous blotches, longest in the centre, and narrowing into shorter and often irregular spots, as they approach the costal margin and the middle of the wing. The double row of ochreous spots is continued as a single row to the first nervure by broadly marked quadrate blotches.

Outside the dark mark which bounds the ochreous, a reddish-fulvous band (the second row) passes across the wing to the first nervure, and is broken by the dark nervures into quadrangular spots with ochreous centres, having their hind margins concave, and that next the base of the wing convex. Beyond this, and separated from it by a dark waved band, is a row of semilunar spots (the third row), their convex sides next the base of the wing being ochreous, and their straight sides next the hind

margin fulvous. Between this row and the hind margin, and parallel to it, is a narrow double dark line with slight fulvous interspace. The fringe is a mixture of dark and ochreous scales, those at the ends of the nervures being all dark. No two specimens, however, agree exactly. The colour of the costal marginal area varies according to the preponderance of the light scales. The areas I have mentioned as crossing the base of the wing vary greatly in relative size and in outline, and are often more or less obliterated by the extension of the dark colour.

The rows of ochreous spots beyond them are often suffused with fulvous, thereby approaching var. *artemis*. The band of fulvous blotches beyond them varies in colour according to the extension, contraction, or obliteration of their ochreous centres. The succeeding row, which I have described as semilunar, are sometimes extended to squarish blotches, at others reduced to specks. The double narrow black band is frequently fused into a single dark marginal stripe, beyond which the only light scales are found in the fringe. This is often distinctly banded, dark at the ends of the nervures, with quite light interspaces.

The Hind wing.—The base and inner margin are dark. Near the base of the discoidal cell is generally a small ochreous spot, followed by a dark patch, then ochreous, and then fulvous. Behind the discoidal cell (towards the hind margin) runs a row, or series, of elongated ochreous spots, corresponding to, and practically a continuation of, the first row of the fore wing. These become shorter and more quadrate as they near the anal angle.

Behind the dark line which bounds these is a second row, the most conspicuous, and the most persistent through all varieties, of any of the wing markings. The spots are large quadrilaterals, roughly speaking, though their hind margins are concave. They are a bright fulvous red, with a well-marked round black spot in the centre. They are practically a continuation of the second row of the fore wing. The third row, next the hind margin, being a continuation of the third row of the fore wing, is composed of semilunar spots, their hind margins being the straight side. The colour, however, differs from that of those on the fore wing by being very pale straw colour without any fulvous or ochreous. Behind them are the dark marginal band (double or single as in that of the forewing) and the fringe.

Variety is chiefly in the extension of the dark basal area, which reduces or obliterates the coloured spots, and which reduces, but I think never obliterates, the ochreous spots of the first row. In the colour of the red bands, from bright fulvous red to dull orange. In the hind wing, in the extension of the fulvous second row, which sometimes, near the costal margin, obliterates the first row, and in the size of the semilunar spots of the third row, which when enlarged become very striking

owing to their pale colour, but which are frequently reduced to mere dots or streaks by the extension of the marginal black border. The black dots in the centre of the second row of spots vary considerably in size, being sometimes mere dots, at other times becoming decided quadrate spots, and sometimes appearing also in the spots of the first row.

In any given locality where the species occurs it is generally found that the stamp of the local variety, whatever it may be, exercises a predominating influence over most of the specimens taken there. The local variety in its most pronounced form is not usually the most abundant. Often do we find the great mass of our captures are individuals showing a strong affinity to the standard of the local variety, but embodying therewith a leaning towards one or other forms of the species, with occasionally a more decided approach to such forms.

In this way, I believe, the type form of *aurinia* is perhaps the most widely spread in Britain. In almost every locality therein from which I possess specimens, an approach to the type shows itself in some individuals. Rarely pure, I admit, in many places, but coloured more or less by the local race. Most decided in northern England and southern Scotland. Less so in southern Ireland, the south-west of England, and south Wales. Still less so in central Ireland. Least of all, perhaps, in south-eastern England. Some specimens from Saxony are very markedly of this form, though var. *artemis* perhaps prevails more in many continental localities.

(To be continued.)

THE YOUNG LARVA OF LIPHYRA BRASSOLIS, WESTW.

By T. A. CHAPMAN, M.D., F.E.S.

REFERRING to my note as to an error in connection with this larva ('Entomologist,' 1903, p. 36), it appears from a letter just received from Mr. Dodd that there is no immediate chance of the problem being cleared up. In my note, I acted on Mr. Dodd's definite statement that the larva described was that of a moth, and not that of *L. brassolis*. It now, however, appears that he only infers this to be a moth because it resembles another which he knows to be a moth and is in fact not very distantly related to *Tinea*. Of the larva before us he knows nothing, except that it eats the ant larvæ, precisely what he tells us of *L. brassolis*. He does not know what becomes of it. He does not know the larva of *L. brassolis* in the younger instars.

Now this larva before us is certainly *not* a micro, except

perchance a Limacodid or Zygaenid. If it were a Limacodid, one would expect some cutaneous armature on so small a larva.

The main point, however, is that Mr. Dodd's surmise that this larva is a Tineine is only a surmise, and, at that, without foundation. Queensland may have surprises in store for us as to larval structure, as in other things, but I think we must not invent them before they are proved.

This small larva is, then, a macro, with high probability a Lycænid. What, therefore, more likely than that it is the desired young larva of *L. brassolis*? It will certainly be curious, should this be so, that Mr. Dodd should have accidentally forwarded it as such without knowing he had done so, and believing all the time it was something else.

Provisionally, then, and as a working hypothesis till the contrary is proved, I assert that this larva is the young larva of *L. brassolis*.

It is only just to Mr. South to say that he has throughout believed that this *was* the larva of *L. brassolis*, but, like myself, had to bow to Mr. Dodd's apparently definite statement.

I do not know that Mr. Dodd will have any objection to my quoting the following from his letter of Jan. 12th, 1903:—

"The drought has killed many trees, and caused many others to drop their leaves, so that they were as bare as English trees in the winter; consequently there has been very little food for the green ants, and they have perished in many places where they were very numerous before; and where the ants have outlived the drought, there were to be found no signs of '*brassolis*.' It is just possible that in such a time of scarcity the ants were compelled to eat any larvæ in their nests; no doubt if they tackled them in their early stages they could easily destroy them.

"When I obtained my fine supply (they emerged last January), I naturally expected a big crop would follow and be obtainable in the nests in various localities, but much searching ended in keen disappointment.

"I have not seen a larva during the whole year . . . "

"From the ants' nests I obtain two larvæ, one with rounded segments (same as you received from Mr. South), another with toothed or saw-like edges. I know nothing of the round-segmented one, except that is in the ants' nests and sucks their larvæ.

" It is absolutely certain that *L. b.*, in its maturer stages, feeds upon ant-grubs."

Betula, Reigate : February 24th, 1903.

DESCRIPTIONS OF SOME NEW SPECIES OF CLYTHRIDÆ (PHYTOPHAGOUS COLEOPTERA).

By MARTIN JACOBY.

(Continued from p. 64.

MELITONOMA OCCIPITALIS, sp. n.

Fulvous; the breast and abdomen black; eyes surrounded by a black stripe; thorax extremely minutely punctured with four spots placed transversely; elytra very closely and distinctly punctured; a small humeral spot, another below the scutellum, and a third one, larger, near the apex, black. Length, 6 mill.

Hab. Salisbury, Mashonaland (*G. Marshall*).

Of subcylindrical shape; the head fulvous, with three foveæ, placed in a triangle, rugosely punctured between the eyes, the latter large, ovate, entire, preceded by a narrow black band; clypeus triangularly emarginate in front, labrum flavous; antennæ extending to the middle of the thorax only, black, the lower three joints flavous; thorax transversely subquadrate, the sides nearly straight, the posterior angles rounded, the disc with a few fine punctures at the sides, fulvous, with four round black spots placed transversely; scutellum pointed, fulvous, the base black; elytra rather distinctly lobed below the shoulders, very closely, finely, and irregularly punctured, the interstices finely transversely wrinkled below the middle, the shoulders with a small black spot, a larger spot placed near the suture below the base, and another much larger one of elongate shape near the apex of each elytron; legs entirely fulvous; under side black, closely pubescent.

Of this very distinct species Mr. Marshall obtained two specimens, of which I am not able to state the sex with certainty; the tarsi are rather short.

MELITONOMA CLAVAREAUI, sp. n.

Pale flavous; the head, femora, and the abdomen partly black, closely pubescent; thorax impunctate; elytra very finely and closely punctured, each with five small black spots (1, 2, 2); tibiæ and tarsi flavous. Length, 6½ mill.

Hab. Guelidi, Africa.

Head flat, black, closely pubescent, the epistome triangularly emarginate, the vertex impunctate; eyes large, entire; antennæ extending to the base of the thorax, black, the lower three joints flavous; thorax strongly transverse, much narrowed at the sides, the anterior margin straight, the posterior angles rounded, the surface impunctate, flavous, shining; scutellum black; elytra very closely, finely, and irregularly punctured, feebly lobed below the shoulders, flavous, with the usual five small black spots, one humeral and the others slightly before and below the middle, placed transversely; below densely pubescent, of silvery tint, the legs rather long and stout, the tibiæ and tarsi flavous, the first joint of the latter as long as the

following two together ; the first or the first two abdominal segments flavous, the others black.

Lacordaire has described three species in which the tibiæ and tarsi are likewise flavous ; these are *M. truncatifrons*, in which the head is impubescent and finely strigose, and the elytra have an oblique band, although this is sometimes divided into spots as in the above species. *M. sobrina*, Lac., is described as having the tarsi nearly as long as the tibiæ, and belongs perhaps to another genus. The third species (*M. litigiosa*) has the thorax of subquadrate shape, and not narrowed in front ; in the present species this part is much deflexed at the sides, and the latter are greatly narrowed ; the colour of the abdomen is also different. I have probably only female specimens before me, which I received from Mons. Clavareau, with the locality as given.

PEPLOPTERA BRAUNSI, sp. n.

Black ; thorax fulvous, with three black bands, impunctate ; elytra strongly punctate-striate, flavous ; a sutural band, abbreviated anteriorly, a short stripe at the middle of the lateral margins, and an oblique spot on the shoulders, black ; the apex of the tibiæ flavous.

Mas.—Thorax broad, the tibiæ strongly dilated, the anterior ones slightly curved. Length 8 mill.

Hab. Algoa Bay (*Dr. Brauns*) ; Dunbrody (*Rev. O'Neil*).

Very closely allied to *P. curvilinea*, Jac. (*Trans. Ent. Soc.* 1901), but certainly distinct. The head black, rugose punctate between the eyes, and with a rather deep fovea at the middle ; antennæ black, the lower four joints flavous ; thorax broad, with rounded sides, fulvous, entirely impunctate, the sides with an elongate black spot from the base to the middle, the disc with a black band, broad at the base, strongly narrowed anteriorly, and extending to the anterior margin ; scutellum black ; elytra with strong regular and closely placed rows of punctures, the shoulders with an elongate oblique black spot, the lateral margins with a narrow black stripe from before to below the middle, the suture with a very regular black band not extending to the base ; under side closely pubescent, the femora strongly thickened, the tibiæ dilated, flavous, except the extreme base ; tarsi very broad, dilated.

The thorax in this species is broader than in *P. curvilinea*, and has three black bands instead of one, and the sutural stripe is of regular shape, not widened posteriorly ; the tibiæ of the male are more strongly dilated, and of almost entirely flavous colour ; lastly, the species is larger and broader in shape. I received three specimens from Dr. Brauns in Natal, and several others from the Rev. O'Neil in Cape Colony.

MICROPYGA, gen. nov.

Elongate and subcylindrical ; eyes rather small ; thorax transverse, the sides strongly rounded and narrowly margined, the basal lobe broad but feebly produced, posterior angles rounded ; scutellum pointed ; elytra distinctly but not strongly lobed below the shoulders,

only partly covering the pygidium; legs rather elongate, the tarsi moderately broad, their first joint as long as the following two together.

There is no genus amongst the Clythridæ into which the present species may be satisfactorily placed, principally on account of the strongly rounded and widened sides of the thorax and the partly uncovered pygidium, which agrees nearly with *Diapromorpha*, but the thorax in that genus is of totally different shape.

MICROPYGA TRANSVALENSE, sp. n.

Under side black, pubescent; upper side fulvous: thorax impunctate; elytra strongly punctured in closely approached rows; a semicircular spot on the shoulders and a transverse band below the middle black; base of the tibiæ fulvous. Length, 7 mill.

Hab. Transvaal.

Head impunctate at the vertex, the latter convex, intraocular space finely rugosely punctured, with a single small fovea; another one is placed at the base of the antennæ; clypeus very feebly emarginate anteriorly, the anterior edge black; eyes slightly notched; sides of the head truncately produced below the eyes; antennæ comparatively elongate, black, the fourth and following joints strongly transversely serrate; thorax twice as broad as long, of equal width, the sides and the posterior angles strongly rounded, the disc rather convex, entirely impunctate, fulvous; scutellum rather broad, obsoletely carinate, blackish; elytra not wider at the base than the thorax, the basal margin ridge-shaped, the punctuation arranged in closely approached irregular rows; an angular semicrescent spot or band placed at the shoulders, not extending to the suture, and another slightly oblique band below the middle extending nearly to either margin, and slightly widened near the suture, black; under side black, closely pubescent, the base of the tibiæ fulvous; prosternum not visible between the coxæ.

I have three specimens before me, which I received from Mr. Fruhstorfer.

ON THE MORPHOLOGY AND CLASSIFICATION OF THE AUCHENORRHYNCHOUS HOMOPTERA.

By DR. H. J. HANSEN.

(Continued from p. 67.)

4. *Fulgoridæ*.—This family naturally falls into two principal divisions, viz. Fulgorinæ and Delphacinæ, the last being marked out by the long-known powerful movable *spur* at the apex of the posterior tibiæ, whilst this spur is lacking in all Fulgorinæ; in the next place (see above) the *sensory organs on the second peduncular segment of the antennæ* are furnished with bristles in the Delphacinæ, but in the Fulgorinæ with lamellar lobes, "blades," which sometimes are feebly but generally very well developed.

The division Fulgorinæ may be again divided, but this I am not able to realize in detail owing to the inadequacy of my material for research. Of Stål's twelve subfamilies belonging to this family, a considerable number must be rejected, partly because the characters employed by this author are of a largely heuristic nature, and of poor value; partly because the antennal sensory organs (see above) belong to different types, whose occurrence points to the presence of natural groups as their occurrence coincides with other peculiarities in the insect's structure. Thus at least the "Fulgorida," "Dictyopharida," and "Cixiida," Stål, must be thrown into one group, whose sensory organs (in the genera examined by me) are endowed with an encircling of spiniform processes; there is also strong agreement in the structure of the empodia, &c. Next, at least the "Eurybrachida" and "Issida" must be amalgamated, though from the last-named "subfamily" the peculiar genus *Tettigometra*, and perchance other forms, must be separated; the group thus composed (with *Issus*, *Eurybrachys*, and *Callicelalis* as important representatives) is characterized by their sensory organs showing from some to many plain "blades," but not any surrounding circle of spines. *Tettigometra* (at least with the addition of the surely very closely allied *Isthmia*, Stål, unknown to me) must stand as type of a little group characterized by the above-mentioned conspicuous sensory organs, and by the altogether peculiar structure of the insects. Then "Ricaniida" and "Flatida" (and perchance "Acanoniida," Stål) must be thrown together, showing strong similarity in the structure of the wings, scutellum, &c., and agreement in the sensory organs, which are surrounded by peculiar processes, and possess exceedingly few sensory "blades." On "Achilida," "Tropiduchida," "Derbida," and "Lophopida," I do not venture to express any opinion; the probabilities are that in the end a portion of their forms must be placed in the same group as *Cixius*, while the rest may possibly form one whole group, or very few small ones.

I perceive quite well the meagreness of this last section of my paper, on account of the entirely inadequate research, and its lack of thoroughgoing sharp characterization, and I ought therefore, perhaps, not to have dealt with it. On the other hand, it occurs to me, however, to contain divers propositions, critical elucidations and hints, that will be of significance for a future systematist, who, with the aid of lens and microscope, will undertake the difficult task of a thoroughgoing group-erection of related Jassid and Fulgorid genera, with adequate material; this last is absolutely necessary, if these erections are to possess some lasting value. If this aim is approached, I think then that this section (with the more special researches on antennæ, tibiæ, and tarsi, on which it is based) will have its justification as a small preliminary work.

ON THE PARASITIC HYMENOPTERA AND TENTHREDINIDÆ COLLECTED BY MR. EDWARD WHYMPER ON THE "GREAT ANDES OF THE EQUATOR."

By P. CAMERON.

In the "Supplementary Appendix" to Mr. Edward Whymper's 'Travels amongst the Great Andes of the Equator,' 1891, I described the ants taken by Mr. Whymper during his memorable journey in Ecuador in 1880. The parasitic species are not numerous, being only twelve in number, but the new genera are seven. They are, however, of great interest from their having been taken at great elevations, most of them having been captured at altitudes of from 7000 to 13,300 ft. Some of the genera recorded in the 'Travels,' p. 356, are erroneous, or are used in a wider sense than they are by more recent writers.

ICHNEUMONIDÆ.

ICHNEUMONINI.

TYANITES, gen. nov.

Post-petiole widely dilated; its width double its length dorsally-ventrally; the apex of the abdomen bluntly pointed. Median segment without teeth; the areola large, longer than wide, at the base separated from the depression by a keel; the lateral areæ are not distinctly separated. Apex of clypeus bluntly rounded, almost transverse. Antennæ as long as the abdomen, short and stout; the basal joints of the flagellum not much longer than wide. Areolet 5-angled, much wider at the apex than at the base, through the cubitus having an oblique slope from the base to shortly beyond the middle; the discocubital nervure without a stump of a nervure. Legs short and stout; the tarsi stoutly spinose on the under side.

The head is well developed behind the eyes; the face is flat and not clearly separated from the clypeus; the apical tooth of the mandibles is long and sharply pointed; the subapical is short and blunt. The pronotum is bordered laterally by a stout keel, and there is a stout keel between the two hinder coxæ. Scutellum large, flat; at the base it is as wide as its length; it becomes narrowed gradually towards the apex, and is not margined at the sides; the post-scutellum is widely bifoveate at the base. The post-petiole is flat in the middle, and not much raised above the sides. The second segment is smooth; not striated at the base. There are seven abdominal segments; the last is well developed all round, and is as large as the preceding. The third and fourth joints of the tarsi are distinctly narrowed at the base, and widely roundly emarginate at the apex.

Comes near to *Probus*.

TYANITES RUFIPES, sp. nov.

Black; the basal half of the antennæ reddish-yellow; the apical half brownish beneath; a mark on the pronotum and the scutellum yellowish; the basal two segments of the abdomen red; the legs ferruginous-yellow, with the coxæ and trochanters black; the wings

hyaline, the stigma testaceous, the nervures darker coloured. ♀. Length, 11 mm.

Hab. Hac. Antisana, 13,300 ft.

Head black; the inner orbits and the sides and apex of the clypeus yellow; the mandibles for the greater part rufous. Face strongly punctured, closely in the centre, more sparsely on the sides; the clypeus has a row of punctures on the upper and lower edges. Front and vertex closely and coarsely, the outer orbits more widely and not so strongly punctured. Mandibles dark rufous, their apex black. Palpi dark testaceous. Pro- and meso-thorax closely and distinctly punctured; the sternum smooth and more shining. The edges of the propleuræ behind are irregularly striated; and there are some stout striæ below the hinder edge of the tubercles. The metapleuræ are, if anything, more strongly punctured than the meso-. Scutellum punctured closely, but not strongly, round the sides; the central part is only sparsely punctured. Post-scutellum coarsely aciculated and closely punctured; the basal foveæ are large, round and deep. Metanotum coarsely, closely rugosely punctured; the apical slope is closely rugose; the lateral apical keel in the middle projects into a broad, not very prominent, tooth. Legs covered with a pale down; the tibial and tarsal spines are rufous. The petiole is dark rufous (perhaps it is discoloured), the post-petiole is closely punctured; the second segment is ferruginous; the gastrocelli shallow, impunctate.

VABSARIS, gen. nov.

♂. Antennæ not longer than the abdomen, stout, distinctly tapering towards the apex; the joints not serrate. Head with the temples broad, rounded, not obliquely narrowed. Face flat; the apex of the clypeus broadly rounded. Scutellum roundly convex, not much raised above the level of the mesonotum; its sides not keeled. Median segment not spined; its spiracles small, about three times longer than wide, straight, rounded at the base and apex; the areola distinctly wider than long. Wing areolet 5-angled; the disco-cubital nervure without a stump of a nervure. Abdomen bluntly pointed at the apex; the ventral keel is on segments 2, 3, and 4. Legs short and stout; the tarsi thickly spinose.

There is a narrow keel before the middle of the propleuræ; the face slightly projects in the middle; the areola is widely separated from the base of the segment, which is widely, deeply depressed, and has its sides bordered by a keel.

In Ashmead's arrangement (Bull. U. S. Nat. Mus. xxiii. p. 18) this genus would come in near *Amblyteles*. I only know the male; but that should be readily known by the short thick antennæ, by the broad temples, rounded, not obliquely narrowed, behind, by the median segment not being spined, and by the short metathoracic spiracles, which are not only shorter, but broader than they are in *Amblyteles* or *Pseudamblyteles*.

VABSARIS FORTICORNIS, sp. nov.

Black; the legs, the second abdominal segment, the apical two-thirds of the third, and two marks on the centre of the fourth, ferru-

ginous; the coxæ and trochanters black, and there is a broad black band on the under side of the hinder femora at the apex; the wings are hyaline; the stigma light, the nervures dark, testaceous. ♂. Length, 10 mm.

Hab. Hac. Antisana, 13,300 ft.

Antennæ black, stout, distinctly tapering towards the apex; short, not much longer than the head and thorax united. Head black, the inner orbits narrowly yellow; strongly and closely punctured, except the clypeus and the lower part of the front; the clypeus smooth, with an irregular row of punctures round the top and bottom. Mandibles black, broadly rufous in the middle. Palpi pale testaceous and covered with white pubescence. Thorax closely and strongly punctured, and thickly covered with white pubescence; the basal half of the propleuræ is smooth in the middle, sparsely punctured on the top and bottom; the punctures on the apical half are close, large and elongate. The scutellum is punctured; the punctures are smaller and more widely separated than they are on the mesonotum. Metanotum irregularly rugosely punctured; the posterior median area is closely transversely striated. Legs rufo-testaceous; the coxæ and trochanters are black; the tarsi are thickly spined. The petiole is sparsely punctured; the post-petiole impunctate; the second segment is obscurely punctured round the edges; the gastrocœli smooth, shallow; the third segment is closely, but not very strongly, punctured; the others are smooth.

HEMITELINI.

LARSEPHNA, gen. nov.

Median segment with two distinct transverse keels and no lateral ones. Metathoracic spiracles oval. Discoidal cellule closed at apex. Transverse median nervure in hind wings not broken; the first abscissa of radius half the length of the second. Antennæ 22-jointed, the basal three joints of flagellum equal in length. Parapsidal furrows indistinct and widely separated.

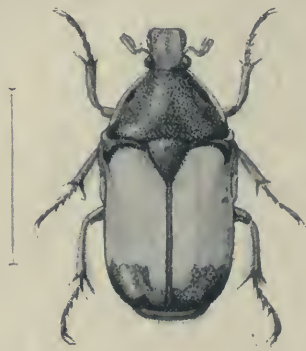
The eyes are large. The cubitus is obliterated beyond the areolet; the metapleural keel is complete; the basal keel on the metanotum is broadly turned backwards in the middle, and is united to the base of the metanotum by two short oblique keels, which form a small area. The apex of the clypeus is rounded; the occiput is margined. Stigma large, triangular.

This genus is referred to the *Hemitelini* from its general body form, and from the alar neurulation; but the absence of longitudinal keels on the metanotum and its consequent absence of areæ are more characteristic of the *Cryptina*. There is a genus of *Hemitelini*—*Chirotica*, Foer.—which has not the metanotum areolated; but the present species cannot be referred to it.

(To be continued.)

DESCRIPTION OF A NEW CETONIID BEETLE FROM
BRITISH EAST AFRICA.

By E. A. HEATH, M.D., F.L.S.

*PLÆSIORRHINA UGANDENSIS*, sp. nov.

Head, pronotum, and scutellum brownish olivaceous, lateral margin of pronotum, the elytra, the sternal process, a small spot at the base of head beneath, sternum and abdomen, luteous; base of the elytra, sutural margin, and apex of the elytra a little transversely produced upward on each side, brownish olivaceous. Elytra, scutellum, and thorax finely punctured, the segments of the abdomen in alternate bands of luteous and brownish olivaceous. Legs luteous, with their upper margins blackish olive. The tibiae of the middle, and hind legs, finely fringed with yellowish hairs, as also is the olivaceous pygidium. Long. 9 lines. Max. lat. 5 lines.

Hab. Uganda, B. E. Africa (W. A. Crabtree).

NOTES AND OBSERVATIONS.

THE INSECT FAUNA OF THE COUNTY OF ESSEX.* — There are probably few among the present generation, particularly those who dwell in the less urban disiricts, who do not take an interest in some branch of natural history, the study of insect life in some form perhaps being the most popular. To such, a well-compiled list of the fauna of a given area is a useful work of reference, and those responsible for the plan of the "Victoria History" have done well in devoting a large share of the space at their disposal to this subject.

The section under notice occupies 102 pages, of which the first is devoted to an introduction, setting forth the sources from which the information for compiling the lists has been obtained, and the methods

* Section "Insecta" from the 'Victoria History of the Counties of England.' (London, 1903. Archibald Constable Limited). Issued to subscribers only.

employed in dealing with it. Orthoptera occupies three pages, in which some twenty-one species, namely three earwigs, three cockroaches, seven grasshoppers, six locusts, and two crickets are enumerated. To the Neuroptera and Trichoptera the next four pages are devoted, about three-fourths of the known British species of dragonflies being mentioned. Hymenoptera claims nineteen pages; Coleoptera nineteen; Lepidoptera forty; Diptera nine; Hemiptera five; and the remaining two pages are occupied with a brief life-history of the Aphides. It will thus be gathered that something more than a mere list of names is given, and even in those orders where this barren system has been resorted to, much of the objection that might be taken to it is removed by an introduction setting forth the chief characters of the order dealt with, and calling attention to the more important species and their economic bearings. The Lepidoptera is treated in narrative form throughout, and forms a very interesting and complete history of that order for the county of Essex. English names are used for the butterflies, Sphinges, and Bombyces, and for some of the more familiar species in some other orders, but, as they are invariably accompanied by bracketed scientific names, identification is easy, and no exception can be taken to their use; indeed, having regard to the class of readers into whose hands a county history is likely to fall, their retention is perhaps an advantage.

The name of the compiler of the lists is not definitely stated, but we have good reason for believing that this portion of the work was carried through by Mr. W. H. Harwood, than whom few have a better all-round knowledge of this county's insects, or would be better able to make full use of the information generously supplied by the numerous field-workers and specialists whose names appear in the first page of this section.

The first sentence of the introduction concludes with the words, "It is hoped that the information now given will be of value as well to the student of economic entomology as to the collector,"—a hope that we cordially endorse, but we wonder how many "collectors" or "students of economic entomology" there are in this agricultural county of Essex that are in a position to obtain the costly volumes in which the information is contained. It seems a pity that these interesting lists, purposely written in a popular style, should not be obtainable as *separata* at a popular price.—R. A.

LARVÆ OF VANESSA POLYCHLOROS.—In the summer of 1901 I found a brood of the larvæ of this butterfly feeding on one of the highest branches of a balsam poplar in my garden, and, as I wanted a fresh series, I shook some of them down, and placed fifty of the largest in a breeding-cage. They were then nearly full-grown, and in the course of a few days all had changed to healthy-looking pupæ. But I only bred one butterfly, the other pupæ being all stung, and upon opening some of them I found them crammed with the small larvæ or pupæ of *Apanteles*; some of them contained more than a hundred. Last season these larvæ were unusually abundant, and on July 8th, while riding between Dovercourt and Walton-on-the-Naze, I must have seen scores of their nests on elms by the roadside. From these I obtained fifty that were just full-grown, and fifty about a quarter-grown. The latter I sleeved on a wych elm in my garden, and thought, as they were so

small, they would probably be free from parasites. But from the hundred or so pupæ I only bred one butterfly, the remaining pupæ, as in the previous year, being all stung. Are these larvæ usually so dreadfully infested? Very few seem to have escaped last year in this neighbourhood, for I do not remember having seen any of the butterflies on the wing during the late summer, and if only a small proportion of the larvæ that were about had produced imagines I should surely have seen some of them.—GERVASE F. MATHEW; Dovercourt, Essex, March 13th, 1903.

THE MILD WEATHER.—We have had some remarkably mild weather here since the beginning of last month. Hawthorn bushes were bursting into leaf in sheltered places as early as February 9th, and willows were in bloom before the end of the month. At the present time the hedges are looking quite green where there is much hawthorn, and elm shoots, willow, blackthorn, bramble are all coming out. I visited the woods yesterday, and found some of the willow bushes already passing. *Pieris rapæ* was seen on February 18th and 19th, and yesterday *Vanessa cardui* was noticed sunning itself on a brick wall.—GERVASE F. MATHEW.

THE HABITS OF TACHYTES AND PARANYSSON.—On June 7th, 1899, I found some large wasps of the genus *Tachytes* burrowing in the soil on the campus of the Agricultural College at Mesilla Park, New Mexico. They made mounds about two inches high and six in diameter, the tunnel being half an inch in diameter, and going down a foot or more. Owing to the extreme looseness of the soil, I was quite unable to trace the burrows to the end; one, which I left apparently hopelessly spoiled, was nevertheless opened up again by the wasp next day. The specimens of *Tachytes* captured were females, and in Fox's table (Proc. Philad. Acad., 1893) they run to *T. crassus*, from which they differ by the red femora. I do not regard them as representing a new species, however, as I am confident that they are *T. exornatus*, Fox, known hitherto only in the males. *Paranysson texanus*, Cresson, was very common about the burrows, entering them freely, as though it were parasitic on the *Tachytes*. What we are to understand from this fact, I do not know.—T. D. A. COCKERELL.

“EMPEROR OF MOROCCO.”—In reply to Mr. W. F. Kirby's question (*ante*, p. 17), I note that the Rev. F. O. Morris, in his ‘History of British Butterflies,’ uses the name “Emperor of Morocco” as a synonym of “Purple Emperor.”—R. F. TOWNDROW; Malvern Link.

OVIPOSITING OF ERASTRIA FUSCULA.—For the past few years I have attempted without success to induce *Erastria fuscula* to oviposit. I have enclosed sprays of bramble and raspberry with the female, both of which are given as its food-plant. *Molinia carulea*, or purple melic-grass, I have not tried, as I have never found it growing where I take the insect. Perhaps some entomologist who has met with better success will come to my assistance.—CHAS. E. PARTRIDGE; 72, St. John's Park, Blackheath.

MERRIN'S CALENDAR.—We are pleased to hear that it is proposed to issue a new edition of ‘Merrin's Lepidopterists' Calendar.’ The work is being undertaken by E. E. B. Prest, M.A., F.Z.S., and H. M. Stewart, M.D., M.A. We understand that these gentlemen will

cordially welcome any offers of help from practical lepidopterists, and any entomologist willing to assist is asked to communicate with E. E. B. Prest, Awa, Dacres Road, Forest Hill, S.E.

CASSIDA VIRIDIS IN CANADA.—Last summer, Mr. A. F. Winn, of Montreal, when on a collecting trip at the Lévis Heights, Quebec, obtained a large number of a species of tortoise-beetle new to our cabinets. Considerable attention was drawn to this insect, on account of the authorities differing as to identification. The Rev. E. Roy, Lévis College, published a long account of it, with illustrations, in 'Le Naturaliste Canadien,' xxix. 145, calling it *C. thoracica*, Ill., a species known in the United States; and the Rev. Dr. T. W. Fyles, also of Lévis, in the 'Canadian Entomologist,' xxxiv. 273, recognized it as *viridis*, Linn. These differences of identification created quite a searching up of references and looking for types. By the kindness of B. Towlin, Chester, England, who sent me specimens of *viridis* captured in Cardiff, Wales, I am now sure that the Rev. Dr. Fyles is right. They have apparently come to stay, as large numbers were found feeding on the burdock, *Arctium lappa*, Linn., a weed no one will object to their eating up. It must have been carried over among the food for animals brought to this country.—CHARLES STEVENSON; Montreal, Que.

CAPTURES AND FIELD REPORTS.

LARVA OF PLUSIA MONETA.—I thought it might interest your readers to know that the larvæ of *P. moneta* are beginning already to feed in gardens. I took three larvæ this morning, in the garden, in this road; they were in the tops of the new shoots of the monkshood, under a sunny fence. Last year I was successful in rearing to the imago five larvæ which I found in the same place, but the larvæ this year are nearly as large in March as they were at the beginning of May last year.—ED. G. J. SPARKE; Christchurch Villas, Tooting Beck, S.W., March 26th, 1903.

HESPERIA (SYRICHTHUS) MALVÆ VAR. TARAS IN SUSSEX.—On or about June 15th last year I took, at Hailsham, a fine example of the form of *H. malvæ* in which the usual white markings are confluent. The form is figured in Newman's 'British Butterflies' as *Hesperia lavateræ*.—J. B. BROWNE; 43, Southbrook Road, Lee, S.E.

REARING ENNOMOS EROSARIA AND E. FUSCANTARIA.—I too, like Mr. Oldaker (*ante*, p. 29), reared *Ennomos erosaria* and *E. fuscantaria* during the last season, but my experience has been very different from his. I "sleeved" out my larvæ of both species before the first week, —*erosaria* on an oak in my garden, and *fuscantaria* on an ash in the neighbouring park,—taking care in the latter case to put the sleeve sufficiently high to be out of the reach of cattle. Of the *erosaria* I should think at least eighty per cent. attained the perfect state, coming out at the beginning of August, of full size, with hardly a cripple among them. *Fuscantaria* grew much more slowly, and I had not so large a percentage of moths, but those I did get were equal in size to what I have taken at large. I attribute my success to the sleeving,

which I believe to be by far the best plan for all larvæ which do not enter the earth to pupate; and if Mr. Oldaker has not tried that plan, I would suggest that he should do so next time he has ova of these two or any other "thorns."—(Rev.) CHAS. F. THORNEWILL; Calverhall Vicarage, Whitchurch, Salop, Jan. 7th, 1903.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—*February 4th, 1903.*—Professor E. B. Poulton, M.A., D.Sc., F.R.S. (President), in the chair.—The President announced that he had appointed the Rev. Canon Fowler, M.A., D.Sc., F.R.S., Professor Raphael Meldola, F.R.S., and Dr. David Sharp, M.A., F.R.S., F.L.S., as Vice-Presidents for the Session 1903–1904.—Mr. T. Ashton Lofthouse, of the Croft, Linthorpe, Middlesbrough, was elected a Fellow of the Society.—Dr. T. A. Chapinan exhibited two male specimens of *Orina tristis* var. *smaragdina*, taken at Pino, Lago Maggiore, on May 30th, 1902, still alive; and living larvæ of *Crinopteryx familiella*, second generation, bred from the egg at Reigate, the parent moths having been taken at Cannes in February, 1901.—The Rev. F. D. Morice exhibited, with drawings of the abnormal parts, an hermaphrodite of *Eucera longicornis*, Linn., showing one female antenna normal, and one male antenna remarkably shortened and with the joints greatly dilated; the clypeus and labrum one half white (the male character), and the other half black as in the female. In the abdomen and legs the female character predominated, but one half of the apical segments and genitalia seemed to be male. In the discussion of hermaphroditism which followed, Dr. Sharp stated that Father Wasman had announced the discovery that in certain Diptera, parasites of Termites, the individual commences its imago life as a male, and ends as a female—a phenomenon entirely new to entomology, though paralleled in some other groups.—Mr. R. McLachlan, F.R.S., exhibited a living example of *Chrysopa vulgaris*, showing the manner in which this species, which is ordinarily bright green, assumes a brownish colour, the abdomen being often marked with reddish spots in hibernating individuals.—Mr. W. J. Lucas submitted specimens of *Miris calcaratus*, and some fruit of a grass, swept up together by Mr. W. J. Ashdown, on the canal side near Byfleet, on July 14th, 1902. The similarity of form and colouring constituted a probable case of protective resemblance.—Major Neville Manders exhibited two specimens of an undescribed species of *Atella* from Ceylon; and remarked that it was a very local insect, only found in the Nitre Cave district, one of the localities most remote from civilization in the island. It was probably a well-marked local race of *A. alcippe*, but easily distinguished from any known species of the genus by the apex of the fore wing being entirely black.—Mr. F. B. Jennings exhibited British specimens of two species of Hemiptera-Heteroptera, viz. two females of *Drymus pilipes*, Fieb., a rare species of the family Lygaeidæ, which were found among dead leaves on a hillside near Croydon in September, 1901; and the black aberration of *Miris laevigatus*, L., recorded by him in the E. M. M. for 1902. The species of *Miris* and the allied genus of Capsidæ, *Megalocera*, are ordinarily grass-green, or pale yellowish.

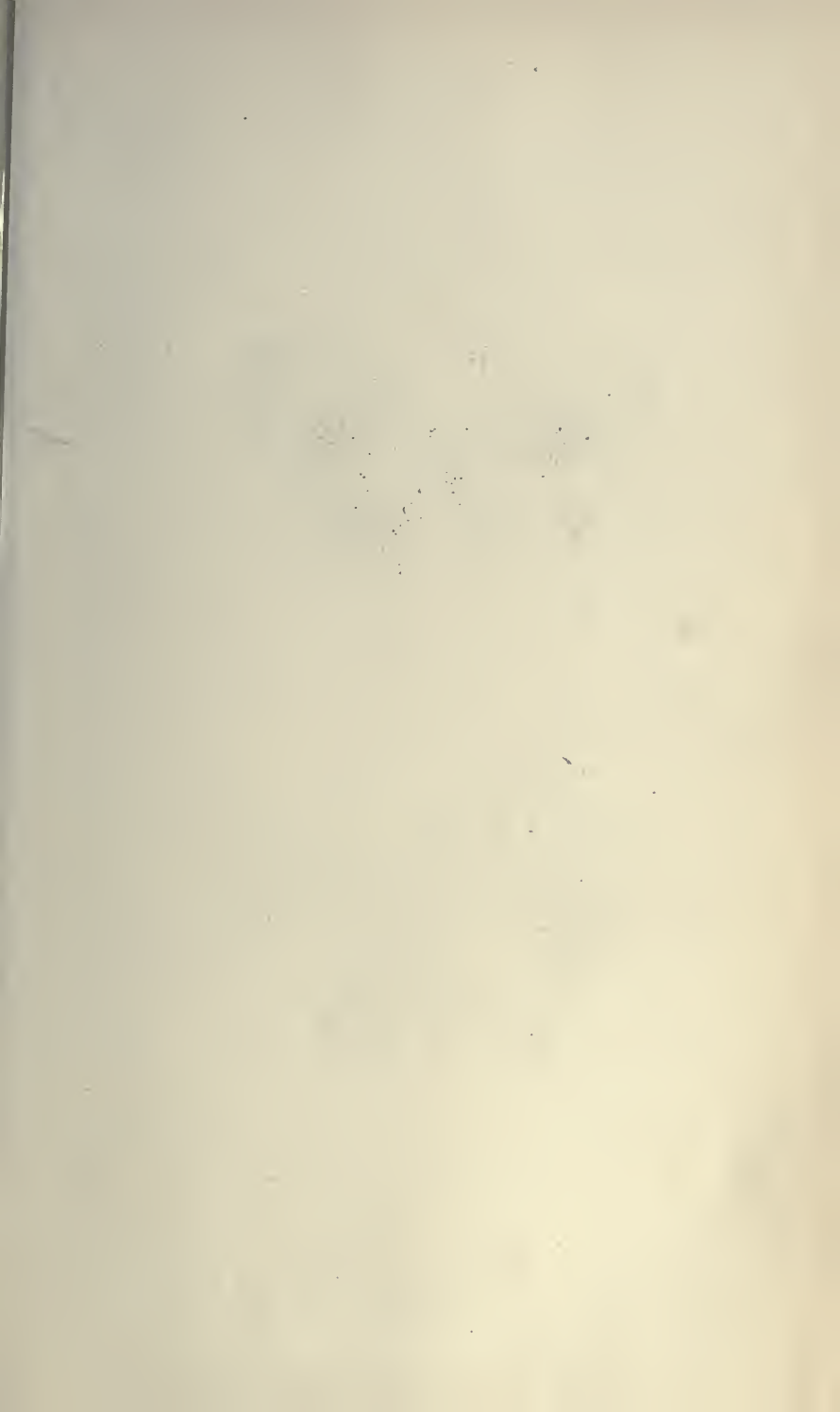
—Mr. H. J. Elwes, F.R.S., exhibited two cases of Arctic butterflies. The first contained specimens from a collection formed by Mr. David Hanbury on the Arctic coast of North America, in the region where the Parry expedition was lost. Of the butterflies observed—fifteen species in all—two had not been taken since they were first described by Curtis sixty years ago. Among them was *Colias boothii*. This species, in comparison with *Colias hecla*, Lef., is undoubtedly distinct in both sexes, but it is most remarkable that the male in colouration and markings appears to approximate more closely to the characters usual in the females of other members of the genus. The collection contained nothing new, but included the rare and curious *Argynnis improba*, Butler, hitherto taken only in Novaya Zembla; a remarkable aberration of *A. chariclea*, Schn., in which the black netting marks were resolved into smeared black lines; *A. pales*, for the first time from this region, precisely similar to the form taken on the east of the Lena river in Siberia; and *Cenonympha tiphon* closely resembling the form from Kamtschatka. The second case contained specimens collected by a Russian between Jakutsk and Verchojansk in north-eastern Siberia at about the same latitude, 67°, as the preceding exhibit. They included many species which occur in the western palæarctic region, such as *Aporia crategi*, *Triphysa phryne*, *Cenonympha iphis*, *Argynnis selene*, *A. ino*, *Melitæa phæbe*, &c., and most remarkable of all *Neptis lucilla*. Also *Parnassius delius*, which Mr. Elwes said was the first *Parnassius* he had seen from within the Arctic circle, and *Colias viluensis*, Mén., an insect peculiar to Siberia, showing remarkable female aberrant forms.—Mr. C. O. Waterhouse gave an account of a nest of a bee, *Trigona collina*, recently received from Malacca. Specimens were exhibited, as were also males and a worker of the much smaller species, *Trigona ruficornis*, Smith, received at the same time from Singapore, and sent by Mr. H. N. Ridley.—Mr. W. J. Kaye exhibited two drawers containing Danaine, Ithomiine, and Heliconine species from British Guiana, all of similar colouration, and forming a Müllerian association with a black hind wing. A diagrammatic table was shown with the exhibit, which included the following species:—*Ithomiinæ*, *Melinæa crameri*, *M. mneme*, *M. egina*, *M. n. sp.*, *Ceratinia veritabilis*, *C. sp.*, *Mechanitis doryssus*; *Danainæ*, *Lycorea ceres*, *L. pasinuntia*; *Heliconinæ*, *Heliconius vetustus*, *H. namata*, *H. sylvana*, *Eueides n. sp.*; and *Erycinidæ*, *Stalachtis calliope*.—The following papers were communicated:—"On the Hysid Genus *Deilemera*, Hübner," by Colonel Charles Swinhoe, M.A., F.L.S. "An Account of a Collection of Rhopalocera made in the Anambara Creek in Nigeria, West Africa," by Mr. P. J. Lathy. "Some Notes on the Habits of *Nanophyes durieui*, Lucas, as observed in Central Spain by Mr. G. C. Champion, F.Z.S., and Dr. T. A. Chapman, M.D., F.Z.S., with a description of the larva and pupa by Dr. T. A. Chapman."—H. ROWLAND-BROWN, *Hon. Sec.*

SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—*January 8th, 1903.*—Mr. F. Noad Clark, President, in the chair.—Mr. Oldaker, of Dorking; Mr. Spitzby, of Canonbury; Mr. Priske, of Acton; Mr. Pratt, of Richmond; and Mr. Goulton, of Balham, were elected members.—Mr. Goulton exhibited an extreme form of the light-coloured Folkestone race of *Ematurga atomaria*.—Mr. Chittenden, a short series of *Ephyra pendularia*, including very fine examples of

the rosy form, v. *subroseata*, from Staffordshire; very pale examples from Chislehurst, and light-banded forms from Ashford.—Mr. Lucas, on behalf of Mr. Kemp, an aberration of *Enallagma cyathigerum* with one stigma missing.—Mr. Kemp, a collection of the genus *Donacia*, comprising sixteen species. He called particular attention to the great variation shown by *D. discolor*, and pointed out the empty cocoon which clearly showed the small perforation which communicates with the intercellular air-spaces of the root to which it is attached.—Mr. Kaye, examples of *Amorpha austauti* and *Smerinthus atlanticus* from N. Africa, together with the exceedingly rare hybrid, *metis*, the produce of *A. austauti*, male, and *S. atlanticus*, female. He also showed the hybrid, *hybridus*, the produce of *S. ocellatus*, male, and *A. populi*, female.—Mr. Adkin read the Report of the Field Meeting held at Otford, Kent, on June 21st, 1902.—Mr. Step read the Report of the Field Meeting held at Byfleet on July 19th, 1902.—A large number of slides were exhibited by Messrs. Step, Lucas, Dennis, Tonge, Cant, Kaye, and Clark, comprising illustrations of protective resemblance in insects, studies of wild flowers, flowering and fruiting habits of our more common trees, ova of Lepidoptera, and special collecting spots. Mr. Kaye's slides were from photographs taken during his tour in British Guiana.

Annual Meeting.—January 22nd.—Mr. F. Noad Clark, President, in the chair.—The early part of the meeting was devoted to receiving the Report of the Council and Officers for the past year, the election of Officers and Council for the coming year, and the reading of the President's Address.—The following is a list of Officers and Council elected for the Session 1903-4:—President, E. Step, F.L.S.; Vice-Presidents, F. Noad Clark and J. H. Carpenter, F.E.S.; Treasurer, T. W. Hall, F.E.S.; Hon. Curator, W. West; Hon. Librarian, H. A. Sauzé; Hon. Secretaries, S. Edwards, F.L.S., and H. J. Turner, F.E.S.; Council, R. Adkin, F.E.S., T. A. Chapman, M.D., H. T. Fremlin, F.E.S., A. Harrison, F.L.S., G. W. Kirkaldy, F.E.S., W. J. Lucas, B.A., and H. Main, B.Sc.—Mr. Hy. J. Turner exhibited specimens of *Symphetrum sanguineum* from the Black pond, Esher, and from Staples pond, Loughton, both being new localities. He also showed *Papilio macrosilaus* and *P. philolaus* from S. America.

February 12th.—Mr. E. Step, F.L.S., President, in the chair.—Mr. Barnett exhibited a very lightly marked specimen of *Ematurga atomaria*, and a very pale example of *Tephrosia luridata* (*extersaria*), both from W. Wickham woods.—Mr. Hy. J. Turner (1) *Erasmia pulchella*, a Chalcosid moth, and one of the most brilliantly coloured of the Lepidoptera; *Campylotes histrionicus*, another species of the same family; and *Areas galactina*, an Arctiid, all from Darjeeling. (2) Specimens of *Abraxas sylvata* (*ulmata*) from Amersham, Bucks, and from Assam, almost identical in tint and markings. (3) On behalf of Mr. Day, of Carlisle, a box of local Coleoptera, consisting of some three dozen species, and including *Hydrothassa hannoverana*, *Omalium septentrionis*, *Agabus congener*, *Stenus guynemeri*, *Hydroporus pictus*, *H. incognitus*, &c. (4) A box chiefly of Pyralidæ from Assam, including representatives of some twenty-five genera.—Mr. Enock gave a lantern demonstration dealing chiefly with details of the transformations of the dragonfly, *Brachytron pratense*, and the butterfly, *Gonepteryx rhamni*.—HY. J. TURNER, Hon. Rep. Sec.





West, Newnan chromo.

Callithea adamsi, *sp. nov.*

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A NEW SPECIES OF *CALLITHEA* FROM PERU.

BY PERCY I. LATHY, F.E.S.

PLATE II.

CALLITHEA ADAMSI, sp. nov.

Upper side:—Fore wing shining purplish blue, deepening to black on lower discal area, a marginal green border slightly tinged with gold, this border widest on costa; apex and upper part of outer margin dark green. Hind wing shining purplish blue, costa and inner margin blackish, a marginal green border slightly tinged with gold, this border widest at anal angle. Under side:—Fore wing green tinged with gold, inner margin and lower discal area blackish, a basal orange patch not extending so far in cell as on costa and inner margin; four submarginal black spots between upper discoidal and lower median nervules; of these the two lower are the larger. Hind wing green tinged with gold, a large basal orange patch, beyond this four rows of black markings, the first just beyond cell being incomplete, the spot below costal nervure and that beyond cell being best defined; the next row is composed of large equal-sized spots, with the exception of the two next the inner margin, which are not so wide as the others; the third row contains smaller spots, the two next inner margin being again smaller than the others; in the fourth row the markings are small and linear. Cilia of both wings white above and below. Exp. 62–70 millim.

Hab. Perené, Peru. 4000 ft. In Coll. H. J. Adams. Fifteen males, including type.

Mr. H. Watkins, my collector in Peru, has been fortunate enough to obtain a good series of males of this very beautiful new species. The female yet remains to be discovered. *C. adamsi* is allied to *C. degandii*, Hew., *C. srnkai*, Hew., and *C. bartletti*, Godm. and Salv.; it may however be at once distinguished from all these species by the restricted basal orange area of the hind wings below; in the three above-mentioned species the orange extends to beyond cell, and adjoins the inner row of black markings. In

C. adamsi the orange does not reach end of cell, and is well separated from the first row of markings; also, in the new species, the inner and outer series of markings are not nearly so well defined as in *C. degandii* and its allies.

NOTES ON THE RESTING ATTITUDE OF *ZAMACRA FLABELLARIA*.

By MISS D. M. A. BATE.



WHILE making a small collection of moths in Cyprus, several specimens were obtained near Limassol of *Zamacra flabellaria*, one of the Geometridæ. When displayed in the drawer of a cabinet it would most probably be passed over by the uninitiated as an uninteresting-looking moth marked with several shades of brown, apparently its only claim to notice being the possession by the male of large and feathery antennæ. However, when seen alive and at rest, one is immediately struck by the remarkable peculiarity of the position it assumes. As may be seen in the accompanying photograph, which represents the male insect slightly larger than its actual size, the fore wings are held erect almost vertically above the thorax, and at the same time each is folded much in the way that a fan is closed. The under wings are also folded, but to a smaller extent, and are only slightly raised above the body, the hinder end of which is also raised, reminding one of the manner in which a woodcock holds its tail while squatting on the ground. The antennæ, at the same time, lie close along the sides of the body.

This moth flies at night, often coming into houses, attracted,

as usual, by the lamplight. One caught at night and covered with a tumbler was found in the morning to be still in this characteristic position, thus making it possible for its photograph to be taken.

This species is an inhabitant of countries washed by the Mediterranean, being found in Greece, Syria, and Morocco, as well as in the islands of Sardinia, Sicily, and Cyprus. In general appearance the Cypriote specimens are slightly darker than those from other localities in the collection of the British Museum.

This moth was originally described by Herr Heeger in 1838 as *Amphidasis flabellaria* ('Beiträge Schmetterlingskunde,' p. 6, Wien, 1838), when he mentions its peculiar method of folding its wings like a fan, on which account he gave it the name of *flabellaria*. He also gives a figure of it at rest, but this does not convey a very good idea of the position, for the wings are depicted as much more loosely folded, and the hinder pair less closely held against the body than appears in the photograph. Writing of it in 1860 (Ann. Soc. Ent. France, t. 8^{me}, Paris, 1860), M. Bellier de la Chavignerie compares its position when in repose to that of some of the Pterophores, or plume moths.

Apparently the only other moths noticed as folding their wings in any way approaching the manner of *Z. flabellaria* belong to quite distinct groups, and are very much smaller, with the exception of the angle shades. These roll up their wings, but hold them in a normal position, while the moths of the genus *Gathynia*, included in the family Epiplemidæ, fold their wings and spread them out in the form of a cross. In the third volume of 'The Fauna of British India' Sir George Hampson writes of this genus, which is found in India and Ceylon, that "the species repose in the form of a cross, with the fore wings rolled up at right angles to the body, the hind wings folded close to the body." From this description it will be seen that the resemblance lies chiefly in the fact that each has a peculiar method of folding the wings, and that here the likeness ends, for in one the fore wings are held vertically, and in the other horizontally. Hence this peculiarity has evidently been independently arrived at, and it seems natural to conclude that there must be considerable advantage to be gained by its adoption. However, without knowing the details of its life and habits, it is difficult to imagine how this attitude could be of any particular use or protection, unless, as Mr. Frohawk suggests, the moth is in the habit of settling on the trunks or branches of trees, in which case the narrow folded wings would closely resemble a loosened piece of bark or a broken twig.

SOME BRITISH FORMS OF *MELITÆA AURINIA*.

BY PERCY E. FREKE, F.E.S.

(Concluded from p. 89.)

Var. *artemis* (Fab.).—In this form the whole of the ground colour is from pale fulvous to brownish fulvous, with the exception of the outer row of (semilunar) spots on the hind wings, which are lighter. The dark markings which form the boundary lines, reticulations, and base of the wing, are scarcely so much developed perhaps as in the type, certainly not more so. The chief variation of the pure form seems to be in the more brown or red tint of the fulvous, although (except in East Kent) variation towards the colouring of the type is common, first showing in an ochreous tendency of the first band of the fore wings, from which every graduation up to the type (*aurinia*) may be found.

In its most pronounced form I believe this variety occurs in eastern England (Kent), south-west England, and South Wales, especially the first, where I have found it less inclined to vary from its local type than those from other localities. I have, however, no specimens from northern England, Scotland, or Ireland that I could refer to it.

Var. *præclara*, Kane.—Mr. Kane, in treating of this species ('Entomologist,' 1893), describes this variety as having "the red and central pale series very vivid in colour, and the black reticulations darker than the type. Ground colour black, strongly and broadly marked, defining the colour blotches sharply, but not reducing them in colour or size. These are of a brilliant terra cotta tint, but the central transverse series (double on the fore wing) are of bright straw colour."

In comparison with the type, the most striking characters of the variety are, that the ochreous colouring is now a pale straw colour, which contrasts very strongly with the blacker tone of the dark markings. The fulvous red is also perhaps somewhat brighter. This is the prevalent form in Ireland. All my Irish specimens, from several localities, are, with very few exceptions, more or less stamped with the characters of this form. One or two individuals from Kildare alone could be said to be really of the *aurinia* type. The highest development of this variety which I have are from Westmeath, many of them being extremely strong contrasts of black and whitish-straw colour, even the space between the costal margin and the costal nervure being sometimes very light.

Mr. Tutt, in his 'British Butterflies,' says, "We have specimens labelled Delamere Forest." I have never myself seen any English specimens that could be referred to this form. Its variation seems to be towards the type on one side and towards var. *scotica* on the other. It is the direct opposite of

var. *artemis*, which I have never found in Ireland. The black spots in the fulvous second row of the hind wing are sometimes surrounded with ochreous. This occasionally occurs to a slight extent in the type also. The black spots are sometimes completely absent, giving a peculiarly red aspect to the hind wing.

Ab. *virgata* (Tutt).—"The central straw-coloured band of the fore wings is normally divided at the top by a black streak. This is sometimes absent, the two series are united, and the band is broad and very conspicuous." (Tutt, 'Brit. Butterflies,' p. 317.) This aberration is not very uncommon in Irish specimens. I have some from Westmeath in which it is carried to an extreme extent. One, a male, has no red, except on the second row of the hind wings. The first row white and large, the inner white spot conspicuous, otherwise the inner half of the hind wing is black. In the fore wing, the usual fulvous markings are almost white. The base of the wing is whitish, almost to the body, with a dull dark spot across the centre, and on the hind margin of the discoidal cell. A dull, rather faint streak of dark colour passes from the middle of the inner side of the discoidal cell to the first nervure. The pale spots of the first band are confluent and much extended, occupying almost the whole central portion of the wing to the first nervure; even the usual dark space between this and the inner margin is nearly white. In other specimens the whitish first band is confluent and much extended, and forms a broad whitish blotch across the wing to the first nervure, but the base of the wing is always dark, and there is always some reddish tint in the second row of the fore wing.

The direct opposite of this aberration is found where the dark areas are very black, and so much extended as to greatly reduce, and even often obliterate, many of the other markings. The relationship to var. *virgata* is shown in the suppression of the fulvous colouring, giving the specimens a black and white appearance, but here the black colour predominates instead of the whitish. In some males that I have from Westmeath, the basal half of the fore wing is black, but sometimes a small white spot is visible near the centre of the discoidal cell. A more distinct one always appears at the hind margin of the cell. The first row is much reduced in size, and is of a clear whitish colour. The second row small, white, with a slight trace of pale fulvous at the hind margin of the spots. Throughout the whole wing the black is much extended, diminishing the other markings. The hind wing is black to the first row, which is small but distinctly whitish. In the second row the spots are small, but the fulvous colour undimmed, and there is always some trace of the whitish third row, as small distinct spots in the wide black marginal band.

In some females this effect is carried still further. The

whitish markings are more reduced in size, the inner series of the double first row being sometimes almost obliterated. With the exception of a white spot at the hind margin of the discoidal cell, and another just inside it, the wing is quite black to the first row, which, being small, extends the black almost to two-thirds of the wing. The fulvous in the fore wing is represented only by a trace along the outer edge of the second row. In the hind wing the black practically extends to the fulvous second row, the first row being only represented by a string of small white spots. Most of the specimens are of small or moderate size. I think this form might fairly be called *ab. nigra*.

Var. scotica (Robson).—Similar to the last aberration in the extension of the dark marking, but the whitish is much duller, and is often replaced by reddish ochreous, which makes a very handsome variety, having an appearance which might be termed black and tan or tortoiseshell.

Mr. Kane ('Entomologist,' 1893) says of it: "The straw-coloured patches are of a duller tone than those of the preceding variety [*praecleara*]. The fulvous submarginal band of the fore wing is suffused centrally with yellowish, but that of the hind wing usually retains its normal colour and size." He says of the black colour: "Filling the basal area of all the wings up to the fulvous discoidal patch in the fore wing, and the pale central series of the hind wing, the pale discoidal spot of which, however, is usually retained."

The only specimens I have of this form are from Westmeath and Kildare. It was named, I believe, from specimens from Aberdeen, but I have never seen the types.

Ab. hibernica (Birchall).—In the 'Entomologist,' 1893, Mr. Kane gives a translation of Birchall's description. Male. Wings above black. Fore wings ornamented with fulvous patches arranged in a series near the hind margin, with a number of others in the middle white or whitish straw-coloured, joined at the inner margin, forming a blotch. The hind wings with a broad fulvous fascia along the hind margin (the fulvous marks on the narrow black outer margin of examples of the type being indistinct or obsolete in the variety.) Beneath pale fulvous, with similar, but indistinct, pattern.

Female:—Fore wings fulvous, marked with a double row of white or pale straw-coloured patches, sometimes confluent, and forming fasciæ, with the outer band carried on across the hind wings. Hind wings as in the typical form, but ornamented with neither pale straw colour nor fulvous patches.

I presume this dark condition is intended to refer only to the basal part of the wing. I have never seen a specimen of this species of any variety—even *var. merope*—that had not some red on the hind wings. Large size is also given as a characteristic of this aberration.

Mr. Kane says that Irish examples of var. *scotica* usually pass muster as var. *hibernica*. This aberration is supposed only to have been found near Rathowen, in Westmeath.

Var. *provincialis* (Boisd.).—Mr. Tutt says, "An almost unicolorous, fulvous form (except the marginal series of paler spots on the hind wings), with the transverse lines somewhat obsolete." He mentions examples of it from Penarth and Lincolnshire. I have only continental specimens. In the females especially, the great suppression of the dark markings is remarkable, the hind margin of the hind wing retaining it most. The ochreous spots are redder than usual, and approach in colour to the rather light and bright fulvous of the other markings. This, with the great reduction of the transverse lines, give the insects a generally concolorous appearance, which is in striking contrast to the much broken-up, tessellated aspect of the type (*aurinia*).

Var. *merope* (Prun.).—A dull, dingy form. The red and yellowish markings in the usual places, but much dimmed, and the size of many of the normally larger spots reduced, so that there is not so much difference between them and those in the smaller row. The dark marking also is dull and hazy. Size small. Mr. Tutt includes this among the British varieties, on the strength of some specimens approaching it in the colouration of the upper side, bred by the Rev. J. S. St. John. I have only European specimens from the Alps, but one small female from Westmeath fairly approaches *merope* on the upper side. The dark markings, however, are blacker, and the fulvous (second) band on the hind wing larger and somewhat brighter. Nor does the under side correspond with var. *merope*.

As far as my limited experience goes, it appears to me that our British forms of the species may be divided primarily into three leading varieties: *aurinia* (Rott.), *artemis* (Fab.), and *præclara* (Kane). Besides these we may perhaps include *brunnea*, of which I know nothing, and *provincialis*, of which, as a British variety, I have no experience. But *signifera* (Kane) seems to me to be only one of the many transitional forms, and not a leading variety, and *merope* I cannot regard as British.

The first (*aurinia*) seems in Great Britain to be the more northern form, also the one which, in most other localities, is apt to appear among the local variety, and more or less to influence it. Thus we find in the southern part of England and Wales, and in Ireland, individuals which might fairly be called *aurinia*, or a more or less close approach to it, appearing among those which we must refer to the local variety; but even these last are very variable, and many of them show more or less traces of the *aurinia* form.

Variation in this leading variety is from the extreme dark northern form (*scotica*) to the type, and through innumerable transitions inclining towards one or other of the other two leading

varieties. *Scotica* (Robson) appears to me to be but a form of this leading variety, and corresponds with the dark form of *præclara*, which I have here spoken of as *nigra*.

Var. *artemis* seems to be confined with us to southern England and South Wales. I have seen no northern English or Scotch specimens that I could refer to it, and I have never seen anything approaching it from Ireland. It seems to vary towards *aurinia* only.

Var. *præclara* is the Irish form, and appears to be confined to that country as far as I know. It varies from *aurinia*, through many phases, to the extreme forms *virgata* and *nigra*. The latter corresponds to the *scotica* form of *aurinia*, and in these the two leading varieties approach each other, the chief difference being, that that of *præclara* always retains the light markings very whitish, no matter how much they may be reduced by the extension of the black parts.

A NEW COCCID OF THE GENUS *ASTEROLECANIUM* FROM EGYPT.

By T. D. A. COCKERELL.

Asterolecanium pustulans (Ckll.) var. *sambuci*, n. var.

♀. Scale about $1\frac{1}{3}$ mm. diameter, almost circular, slightly convex, pale yellow, with a rather long dense very pale pinkish fringe.

♀. Mouth-parts brownish, diameter about 60μ ; scattered large figure-of-eight (double) glands in the skin, diameter of a gland 12μ ; margin with two rows of simple glands and one row of double, the simple glands at intervals of about 9μ , the double glands about 9μ diameter and 3 (rarely 6) μ apart.

Hab. On bark of *Sambucus*, not producing pits. Le Caire (Cairo) Egypt; received from Dr. P. Marchal, who received it from M. Vayssière. The scale is quite like that of *A. pustulans*, there is practically no external difference. The double glands of the margin are larger and very much closer together than in *A. pustulans*. The species of *Asterolecanium* differ in the arrangement of the marginal glands. In some species (as *A. fimbriatum*, *A. ventuosum*, *A. algeriense*, and *A. viridulum*) there are two rows of double glands; in others (as *A. pustulans*, *A. townsendi*, *A. ilicis*, *A. ilicicola*, and *A. petrophilæ*) there is only one row.

A. pustulans sambuci is very likely a valid species, but it is so near to *pustulans* that I treat it as a variety for the present. It can be distinguished from *A. ilicis* by the fringe, and the double glands of the margin being close together. *A. ilicicola* occurs on leaves, and has only one row of simple glands.

East Las Vegas, New Mexico, U.S.A.: Jan. 6, 1903.

UPON MATERNAL SOLICITUDE IN RHYNCHOTA AND OTHER NON-SOCIAL INSECTS.

By G. W. KIRKALDY.

SINCE my brief note on this subject (Entom. 1902, vol. xxxv. pp. 319-20) I have seen a lengthy paper by the celebrated J. H. Fabre [5]* on "Pentatomas," in which he ridicules De Geer's account, and consigns the whole recital to the limbo of fairy tales.

I have therefore looked up the literature of the subject, and have now summarized it, in the hope that some of the readers of 'The Entomologist' may be disposed to give the phenomena their attention during the ensuing months.

(a) ORDERS OTHER THAN RHYNCHOTA.

The earliest reference to parental care in non-social insects appears to be that of Goedaert [9], who states that the mole-cricket (*Gryllotalpa gryllotalpa* (Linn.)) take particular care of their eggs, raising up the nests in a hot and dry season so that the young almost touch the surface of the earth, and are thereby cherished by the sun's heat; contrariwise they sink the nests down when the air is cold and moist. They also act as unceasing sentinels round the nest. Rösel [22] cites the above account, and gives a coloured sectional drawing of the nest and eggs. Audouin [1] states that all authors agree in saying that the mole-cricket takes the greatest care of its young, but Goedaert is the only author I can trace who relates his personal observations.

The discovery of the maternal solicitude of the earwig (*Forficula auricularia*, Linné) by Frisch [6], confirmed and extended by De Geer [8], Rennie [21], Kirby and Spence [14], Camerano [4], &c., is so well known and authentically established by recent observations, that it is not necessary to dwell upon it. Sharp [23] states that *Labidura riparia* "is said to move its eggs from place to place, so as to keep them in situations favourable for their development," but I have not been able to trace the original source of this statement. Burr [3] also notes that "a certain entomologist" (Col. Bingham) "once told me that in Burmah, while sitting round the camp fire one night, they disturbed a large earwig who was guarding a little batch of eggs. Her first care was not for herself, but for her eggs. She showed great concern for their safety."

In the Hymenoptera, I do not refer to the well-authenticated instances of maternal providence in the Sphegidae and other families, this notice being confined to actual personal and con-

* These numbers refer to the bibliography at the close of the paper.

tinuous care. A summary of the former will be found in Sharp [24], p. 111. Of the latter there is one instance, viz. *Perga lewisii*, Westwood, a Tasmanian sawfly. The habits of this Tenthredinid were related [16 and 17] by R. H. Lewis, who informs us that the eggs, in number about eighty, are placed transversely in a longitudinal incision between the two surfaces of a leaf of a species of *Eucalyptus*. On this leaf the mother sits till the eggs are hatched. She follows the larvæ, "sitting with outstretched legs over her brood, preserving them from the heat of the sun, and protecting them from the attacks of parasites and other enemies." It should be noted, however, that broods accidentally or purposely deprived of the mother appeared to thrive just as well. These observations have been briefly confirmed by Froggatt [7].

In the Coleoptera, the only instances known to me occur in the Scolytidæ, among the Ambrosia beetles, and a consideration of these scarcely comes within the scope of this notice, since they are not non-social insects. The reader may be referred to Kirby and Spence [14] and Hubbard [25].

Mr. R. South and Mr. L. B. Prout are not aware of any instance among the Lepidoptera, and similar advice has been given me by Mr. G. H. Verrall and Mr. J. E. Collin of the Diptera, and by Mr. W. J. Lucas of the Neuroptera. Research on the literature of the Thysanoptera, Anoplura, Thysanura, &c., has failed to trace any such records.

I must here also express my thanks to Messrs. W. F. H. Blandford, C. O. Waterhouse, C. J. Gahan, W. F. Kirby, and Drs. G. Breddin and D. Sharp, for information and hints.

RHYNCHOTA.

The earliest Rhynchotal notice is that of Modeer [18]. In speaking of "*Cimex ovatus pallide griseus*," he distinctly affirms that the eggs are laid in June on the common birch, in number from forty to fifty, so that the mother can cover them when she sits over them. She does not abandon them except for brief refreshment, and cannot be removed except by superior force. The eggs are hatched at the end of June, and the maternal care is still exercised, for she protects them against the male, whose attacks and the defence of the mother are circumstantially related. The great DeGeer [8] confirms and expands the observations under the head of *Cimex betulæ* (he gives *C. griseus*, Linné, as a synonym!). Boitard [2], in his 'Curiosités d'Histoire naturelle'—a work unknown to me—embellishes these accounts, according to Fabre [5], by noting that when it rains the mother leads her young under a leaf or under the fork of a branch to shelter them, and covers them with her wings. Montrouzier [19] observed the habits of Oceanian Scutellerinæ, a subfamily not closely allied to the Acanthosomatinae (in which the

birch bug is included). His remarks have been recently translated in 'The Entomologist' [15]. Montrouzier appears to have been unaware of the researches of Modeer and DeGeer. Douglas and Scott [20] quote a letter addressed to the former by E. Parfitt, enclosing an adult female and young ones identified as "*Acanthosoma griseum*." This letter circumstantially verifies DeGeer's observations, which, so Parfitt states, were unknown to the English entomologist. These habits were still further confirmed in great detail, in three notices [10, 11, and 12], by Hellins, a well-known and most careful observer.

Last year I contributed to 'The Entomologist' [15] a translation of Montrouzier's observations [19], and noted "a species of *Spudeus* (?) " sent by Dr. Willey from Birara (New Britain), of which I had under my care for study alcoholic specimens apparently confirming the generally accepted opinion. These specimens belong to the Pentatomine *Coctoteris exiguus*, Distant, a determination kindly confirmed for me by the author of the specific name.

So far the five original observers, viz. Modeer, DeGeer, Montrouzier, Parfitt, and Hellins, agree that the female bug does show parental affection during a comparatively considerable period, and the first-named declares that this is, in part at least, directed against the assaults of the male; but in 1901 J. H. Fabre, the "immortal Fabre" of Darwin, and one of the foremost of modern field observers, has published a lengthy document [5], in which he declares DeGeer* to be mistaken. The gist of Fabre's paper is as follows: The grey bug† is rare in Fabre's neighbourhood; he found three or four specimens which he placed under a bell-jar, but they did not oviposit, though eggs were laid by the green [= *Palomena prasinus* (Linné)], red- and black-speckled [= *Eurydema ornatus* (Linné)], and yellowish [sp. ?] ‡; and Fabre continues, "In species so closely allied, parental care in one ought, at least in some details, to be discovered also in the others." It cannot be too strongly expressed that the last three are not at all closely related to the grey bug, for the last-named belongs to the Acanthosomatinae, the other three to the Pentatominae, subfamilies distinguished apart by considerable and important structural differences. Fabre declares that in these species "the mother paid no attention to her brood; the last egg laid in its place at the extreme end of the final row, she left, careless of the trust; she no longer busied herself with it, and returned no more. If the chances of roaming bring her back, she walks over the heap and passes on indifferent. . . . This

* The Swedish master and Boitard are the only authors mentioned by Fabre, and he appears to be unaware of the independent observations of Montrouzier, Parfitt, and Hellins.

† *Elasmotethus griseus* (Linné) = *Acanthosoma interstinctum* of Saunders's 'Hemiptera Heteroptera of the British Isles.'

‡ Fabre calls these all "*Pentatoma*."

forgetfulness must not be considered as a possible aberration due to captivity. In the full freedom of the fields I have discovered diverse broods, among which are found, perhaps, that of the grey bug; never have I seen the mother mounted over her eggs, as she ought to, if her family required protection as soon as hatched. The mother is of roving inclination and facile flight; once flown far from the leaf which received the treasure, how, two or three weeks later, will she remember that the hour of exclusion approaches? How will she rediscover her eggs, and how again distinguish them from those of another mother? It would be incredible, such prowess of memory amid the immensity of the fields.

"Never, I say, is a mother surprised stationary near the eggs that she has fixed on a leaf, and, more convincing still, the total brood is divided into clutches scattered haphazard, so that the family in its entirety is formed of a number of tribes lodged here, there, and at distances sometimes considerable, but impossible to fix precisely. To rediscover these tribes at time of hatching, earlier or later according to the date of oviposition or the forwardness of the season, and then to reassemble in one flock from the four corners of the universe all the little ones, so feeble and moving so unsteadily—there are in this evident impossibilities. Suppose that by chance one of the groups is discovered and recognized, and that the mother devotes herself to them. The others must in that case be abandoned—and they do not prosper the less. What then is the motive for this remarkable maternal zeal with regard to the care of one of the groups when the majority are left? Such singularities inspire mistrust!

"DeGeer mentions groups of twenty. These would certainly not be the complete family, but just a tribe resultant from a partial oviposition. A *Pentatoma*, smaller than the grey bug, has given me in a single batch more than a hundred eggs. A like fecundity ought to be the general rule when the mode of living is the same. Beyond the twenty observed, what became of the others abandoned to themselves?

"Despite the respect due to the Swedish savant, the caresses of the mother-bug and the unnatural appetites of the father, devouring his little ones, ought to be relegated to the same limbo as the childish tales which encumber history. I have watched in an aviary (*volière*) as many hatchings as I wished; the parents were near at hand, under the same roof. What do they all do in the presence of the young? Nothing at all! The fathers do not dash to drain the juices of their brats! Neither do the mothers rush to protect them! One flits about the lattice-work (*treillis*) [? metal gauze], one settles down to refreshment at the rosemary, while another walks over the groups of newly-hatched youngsters, which he tumbles head over heels, without

any bad intention, but without any discretion. The little beggars are so small, so feeble, that, passing by, he grazes them with the end of his foot and overturns them. Like turned turtles, they vainly kick about; no one heeds them. During three months' assiduous observations I have not noted the slightest appearance of the maternal solicitude so celebrated by the compilers. The newly hatched bugs, packed one against the other, remain stationary for several days on the empty eggs; there they acquire a firmer consistency and brighter colouring. Hunger comes; one of the youngsters leaves the group in search of refreshment; the others follow, happy in their mutual proximity, like sheep at pasturage; the first in moving sets in motion the whole band, who set out for tender places where they may implant their beaks and imbibe; then they all return to their natal place for repose upon the empty eggs. Expeditions in common are repeated over an increasing radius, till at last, somewhat strengthened, the society separates and breaks up, never to return to its place of birth. Henceforth each one lives in his own way. What, then, would happen if, when the troop moves away, there should encounter them a mother of slow gait, a frequent case among the sedate bugs? The young ones, I suppose, would confidently follow this chance leader, as they follow those among themselves who are the first to take to the road; there would then be some similarity to a hen at the head of her chickens; this casual occurrence would lend an appearance of maternal cares in a stranger heedless of her bundle of brats.

"The good De Geer appears to me to have been duped in some such manner: a little colour, involuntarily embellished, has completed the tableau; and then are vaunted in books the family virtues of the grey bug."

Fabre has been led into error, first by his ignorance of systematic Rhynchotology; as I have previously remarked, the form of bug which De Geer had under observation belongs to a subfamily not closely allied to that embracing the bugs watched by Fabre; secondly, by his negligence of previous literature, except that of De Geer (and incidentally Modeer) and Boitard; yet we have an independent observer, Montrouzier, ignorant, apparently, of all previous similar records, who notes a like habit in yet another subfamily, more remote still from either, and that almost at the antipodes of Europe. Moreover, De Geer's accounts are explicitly corroborated by two competent field entomologists whose integrity and capacity have never before been questioned, and one of these (Parfitt) was by his own account ignorant of any literature on the subject. So that Fabre's gibe at Messieurs the Compilers has failed to score. Boitard's account may perhaps be treated a little incredulously, and possibly also Modeer's interpretation of the paternal gymnastics.

In my opinion, at least, it will be necessary to have much more direct refutation of DeGeer, Hellins, and Parfitt than the observations of even Fabre on species of another subfamily.

With regard to Fabre's asseveration that he never once found a female "*Pentatoma*" stationary near the eggs, this is circumstantially contradicted by the precise observations of Hellins and Parfitt in *Elasmotethus*. Neither has the French author proved his theory, upon which he establishes so large a part of his assumptions, that the *Pentatomidæ* (or at least some of them) oviposit in more than one place. It is to be regretted that he did not examine the oviducts of one of the females observed by him. Moreover, it does not appear that Fabre marked any of the female *Pentatominae* observed by him, so as to recognize them in the event of any "chance" returns to the original spot. Fabre also says, "a *Pentatoma* smaller than the grey bug has given me in a single batch more than one hundred eggs," and insists therefore that DeGeer's record of twenty in the grey bug could have been only a partial laying!!

This confines the subject entirely to the *Rhynchota*; now we have also, as noted above at the beginning of this paper, records of the devotion of the mother earwig (and of more species than one), records as well authenticated as such could well be, not only in written literature, but from living observers who have not considered it worth while to register what has always appeared as a thoroughly firmly founded fact. The occurrence in *Gryllotalpa gryllotalpa* seems also authentic, while the recent confirmation by Froggatt, after seventy years' interval, of Lewis's observations on *Perga lewisii* establishes this remarkable case beyond doubt, and it is especially interesting to note that in other Australian species of the same genus entirely different larval habits are known to obtain; the latter is another argument against Fabre. What is there of incredibility in the whole recital? What a limited demonstration of affection, or at least of intelligent power, compared with that displayed by the social *Hymenoptera* and *Neuroptera*! Fabre argues as if parental solicitude and the sense of direction were unknown among the *Insecta*, and his sneer at the inadequacy of the memory of the mother-bug to rediscover the original place of oviposition is remarkable enough from the historian of the habits of the *Hymenoptera*.

To conclude, Fabre may prove to be right, and Goedaert, Frisch, Modeer, DeGeer, Kirby and Spence, Rennie, Montrouzier, Boitard, Lewis, Parfitt, Hellins, Camerano, Froggatt, and Bingham, all, to a man, wrong; but even if so, Fabre has proved nothing at present beyond the fact that the females of two or three species of *Pentatominae*, not particularly closely observed by previous authors, did not manifest any regard for their progeny during his observations. It is perhaps not the "good

De Geer" who "has been duped" but Fabre, who has been led astray by his ignorance of the systematics and bibliography of the Rhynchota.

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[18] 1764.—A. MODEER, "Några märkvärdigheter hos Insectet *Cimex ovatus pallide griseus*, abdominis lateribus albo nigroque variis alis albis basi scutelli nigricante," in Vetensk. Acad. Handl. xxv. pp. 41-57. (Abstract in German (1767) in same journal, xxvi. pp. 43-9, but I have not seen either. See No. 13.)

[19] 1855.—MONTROUZIER,* "Essai sur la faune de l'île de Woodlark ou Moiou," in Ann. Sci. phys. nat. agric. Lyon (2), vii. pp. 91-2. (Relates maternal affection in Scutellerinæ.)

[20] 1865.—E. PARFITT in J. W. DOUGLAS and J. SCOTT, The British Hemiptera, i. pp. 103-4 (*Acanthosoma griseum*).

[21] 1832.—[J. RENNIE], "Maternal care of the Earwig," in Penny Magazine, p. 60.

[22] 1749.—A. J. RÖSEL, Der monatlich herausgegeben Insecten Belustigung, ii. Heuschrecken und Grillen, p. 92, pl. xiv.

[23] 1895.—D. SHARP, Cambridge Nat. Hist. v. p. 214 (*Forficula auricularia* and *Labidura riparia*), and 517 (*Perga lewisii*).

[24] 1899.—D. SHARP, Cambridge Nat. Hist. vi. p. 546 ("Acanthosoma griseum").

The latest notices of Ambrosia beetles are found in—

[25] 1897.—H. G. HUBBARD, "The Ambrosia beetles of the United States," Bull. U. S. Dep. Agric., new series, No. 7, pp. 9-30.

ON THE PARASITIC HYMENOPTERA AND TENTHREDINIDÆ COLLECTED BY MR. EDWARD WHYMPER ON THE "GREAT ANDES OF THE EQUATOR."

By P. CAMERON.

(Continued from p. 97.)

LARSEPHNA VARIPES, sp. nov.

Black, shining; the legs rufous, the hinder femora darker in tint; the hinder coxæ black; the hinder tibiæ pale, the apex and a band near the base black; the hinder tarsi more or less fuscous; wings hyaline, the stigma and nervures dark testaceous. ♀. Length nearly 4 mm.; terebra, 1 mm.

Hab. Pichincha, 12,000 ft.

Antennæ dark testaceous, blackish on the top; the scape paler in colour. Head black, closely and minutely punctured; the mandibles rufo-testaceous. Mesonotum closely, minutely, and distinctly punctured. Scutellum shagreened. Median segment shagreened, most strongly in the middle. Pro- and mesopleuræ shagreened, shining; the meta- closely, minutely, and uniformly punctured. Abdomen rufo-

* I do not know Montrouzier's forename. Hagen cites it as "P." (Bibl. Ent. i. p. 547), but this is merely an abbreviation for "Père." He is indicated in his papers as "R. P." and "P. A.," possibly "Révérend Père" and "Père Abbé."

testaceous; the petiole and the dorsal basal half of the second and third segments black; the basal three segments are closely minutely punctured, the first more strongly than the others. Legs rufous; the posterior coxæ black; the hinder tibiæ and tarsi pale testaceous, almost white; there is a black band near the base of the hinder tibiæ, and a slightly broader one near the apex; the tarsi are darker-coloured, with the joints paler at the base.

LARSEPHNA FLAVOLINEATA, sp. nov.

Black; the second and following segments of the abdomen brownish, their apices narrowly banded with pale yellow; legs rufo-fuscous; the four anterior coxæ and trochanters pale clear yellow; the hinder coxæ and the basal joint of the trochanters black, the apex of the coxæ and the apical joint of the trochanters pale yellow; the base and apex of the hinder tibiæ black; wings clear hyaline, the stigma and nervures fuscous. ♀. Length, 4.5 mm.; terebra, 2 mm.

Hab. Corazon, 12,000 ft.

Thorax smooth and shining, the mesonotum shagreened, the apex of the median segment brownish; the metapleural keel indistinct. The narrow yellow bands on the apices of the abdominal segments are distinct on all the segments, and extend on to the ventral surface; the petiole is deep black; the segments becoming successively brighter and more rufous in tint towards the apex. The large stigma is black at the costa, the rest of it is testaceous; the nervures are fuscous.

The differences between this species and *varipes* may be expressed thus:—

Abdomen for the greater part rufous, not banded with yellow; the fore coxæ and trochanters rufous, the metapleural keels distinct; ovipositor half the length of the abdomen	<i>varipes</i> .
Abdomen black, narrowly banded with yellow, the fore coxæ yellow, the metapleural keels indistinct; ovipositor as long as the abdomen	<i>flavolineata</i> .

CRYPTINA.

CYANOCRYPTUS, gen. nov.

Transverse median nervure in hind wings broken near the middle. Transverse median nervure in fore wings not interstitial. Median segment reticulated throughout, and without a distinct transverse keel. Disco-cubital nervure not broken by the stump of a nervure. Antennæ stout, ringed with white. Apex of clypeus broadly rounded, depressed; it is not separated from the face. Median segment large, with a gradually rounded slope from the base to the apex; its spiracles elongated; the sides at the apex shortly toothed; the pleural carinæ of the metathorax complete. Wings uniformly violaceous; the areolet large, the sides not convergent above. Abdomen smooth; the spiracles of the second segment placed shortly before the middle.

The body is metallic; the parapsidal furrows do not reach to the middle; the scutellum is roundly convex, not much raised; the abdominal petiole is longish, slender, dilated at the apex; the first joint of

the flagellum is longer than the second; the lower part of the mesopleuræ is irregularly striated towards the apex.

In Ashmead's arrangement of the *Cryptina* (Proc. U. S. Mus. xxiii. p. 40) this genus would come in near *Joppoceras*.

CYANOCRYPTUS METALLICUS, sp. nov.

Dark blue, with purple and brassy tints; the wings uniformly fuscous-violaceous, the stigma and nervures black; the antennæ black, ringed with white. ♂. Length, 13 mm.

Hab. Outer slope, Equador, 7-8000 ft.

Antennæ black, fuscous on the lower side; the scape shining, the flagellum dull in tint. Head dark blue with purple and rosy tints; the outer orbits shining, sparsely punctured; the front, vertex, and face more opaque, punctured, but not closely or strongly; the upper part of the front closely and finely transversely striated. Basal half of mandibles strongly, but not very closely, punctured; the two apical teeth are of almost equal size, and are rounded broadly at the apex. Mesonotum minutely punctured; its sides towards the apex are depressed; the scutellum is almost impunctate; its basal depression bears five or six longitudinal keels. The lower part of the propleuræ bears some stout longitudinal keels; its base is bordered by a keel. Mesopleuræ, except above, irregularly longitudinally striated and reticulated. Median segment entirely closely irregularly reticulated; on the sides the reticulations are more regular and oblique. The coxæ, trochanters, and femora are purple with rosy tints; the tibiæ and tarsi are dull black; the tarsi are minutely spined. Abdomen shining, impunctate, dark blue, tinged with purple.

WHYMPERIA, gen. nov.

Antennæ stout, distinctly dilated beyond the middle; their third, fourth, and fifth joints equal in length. Head sharply obliquely narrowed behind the eyes; the inner orbits of the eyes sharply keeled, the keel extending from below the antennæ to the lower ocellus, and clearly separated from the eyes. Clypeus clearly separated from the face; its apex transverse. Mandibles curved, narrowed, towards the apex, but not sharply; the apex with a depression in the centre; the teeth not clearly separated. The upper edge of the pronotum roundly projecting. Parapsidal furrows obsolete. Scutellum large, not much raised. The basal keel on the median segment is distinct; the apical is less distinct in the centre, and projects laterally into a broad tooth; the spiracles are large, elongate. The base of the segment has a large area in the middle, obliquely narrowed towards the apex; its sides are not sharply margined. The pleural furrow is distinct; the metasternal keel is complete; stout at the base, narrower at the apex. Abdominal petiole long and slender, not much thickened at the apex, curved. The areolet is large, broad; the transverse basal nervure is interstitial; the cubito-discal nervure does not have a stump of a nervure; the transverse median nervure in the hind wings is broken in the middle. The metathorax is short, and has an oblique slope from the first transverse keel.

A distinct genus, easily known by the thickened stout antennæ, by the keeled front, by the sharply obliquely narrowed temples, by the projecting edge of the pronotum, and by the long hinder legs. In Ashmead's arrangement it would come in near *Habro-cryptus*.

WHYMPERIA CARINIFRONS, sp. nov.

Black, the head and thorax largely marked with white; the second and following segments of the abdomen rufous, the legs pale yellow, the four hinder femora rufous; the hinder coxæ black, their top with a large white mark; the wings hyaline, the stigma and nervures black. ♀. Length, 11; terebra, 3 mm.

Hab. Ecuador, 1–2000 ft.

Antennæ black, the eighth to fourteenth joints more or less white, the thickened apical joints fuscous. Front and vertex smooth and shining; the face somewhat coarsely striated; the clypeus with scattered punctures round the top and apex; its apex depressed and black. Labrum white, fringed with long golden hair. Mandibles black, with a small curved white spot on the base. Palpi white. Thorax black; the dilated part of the pronotum, two lines in the centre of the mesonotum, narrowed at the base and apex, the scutellum, post-scutellum, a mark, transverse at the base, rounded at the apex, two large marks on the apical slope, a mark on the lower side of the propleuræ, the tubercles narrowly in the centre, a large mark on the top of the mesopleuræ, a larger irregular mark on the lower side of the mesopleuræ, with a rounded incision on its upper side, a mark immediately below the hind wings and the greater part of the upper half of the metapleuræ, pale yellow. The middle femora are darker-coloured than the posterior. Petiole smooth and shining; its apex and a narrow line behind the middle yellow; its ventral surface is brownish; there is a broad, irregular black band near the apex of the second segment.

(To be continued.)

ON BUTTERFLIES COLLECTED BY MAJOR E. M.
WOODWARD IN BRITISH EAST AFRICA.

By EMILY MARY SHARPE.

THE following is a list of the species of butterflies obtained by Major E. M. Woodward on his journey from the coast to Uganda and Nandi. He obtained two new species, which I described under the names *Neptis woodwardi* (Nymphalidæ) and *Planema nandensis* (Acræidæ). Cf. Ann. & Mag. Nat. Hist. (7), vol. iii. pp. 243, 244 (1899).

Family DANAIDÆ.

1. *DANAIS CHRYSIPPUS* (Linn.).—*a, b, ♂ ♀*. Wakolis, Usoga; October 15, 1897.

2. *D. ALCIPPUS* (*Cram.*).—*a*, ♀. Samia Hills, Kavirndo; March 7, 1898.

3. *D. KLUGI* (*Butl.*).—*a*, ♂. Kibaoni, Ukambani; April 20, 1898. *b*, ♂. Tsavo River, Ukambani; August 1, 1897.

4. *AMAUROS ENCELADUS* (*Brown.*).—*a*, ♂. Mondo, Chagwe; February 28, 1898.

5. *A. HECATE* (*Butl.*).—*a*, ♂. Campi Rao, Nandi; March 14, 1898.

6. *A. DOMINICANUS*, *Trim.*.—*a*, ♂. Muani, Ukambani; August 17, 1897.

7. *NEBRODA ECHERIA* (*Stoll.*).—*a*, *b*, ♂. Campi Rao, Nandi; March 14, 1898. *c*, ♀. Eldoma Ravine, Mau; March 21, 1898.

Family SATYRIDÆ.

8. *GNOPHODES DIVERSA*, *Butl.*.—*a*, ♀. Campi Rao, Nandi; March 14, 1898. *b*, ♀. Mbabani, Usoga; March 4, 1898.

9. *MYCALESIS AURICRUDA*, *Butl.*.—*a*, ♂. Wakolis, Usoga; March 4, 1898. *b*, ♀. Nandi; March 16, 1898.

10. *M. SAFITZA*, *Hewits.*.—*a*, ♂. Campi Rao, Nandi; March 13, 1898. *b*, *c*, ♂ ♀. Wakolis, Usoga; October 16, 1898.

11. *M. SAGA*, *Butl.*.—*a*, ♀.

12. *M. TECHNATIS*, *Hewits.*.—*a*, ♀. Campi Rao, Nandi; March 14, 1898.

13. *M. SANDACE*, *Hewits.*.—*a*, ♂. Mondo, Chagwe; February 28, 1898.

14. *M. RHANIDOSTROMA*, *Karsch.*.—*a*, ♂. Mondo, Chagwe; February 28, 1898.

15. *M. MARTIUS*, *Fabr.*.—*a*, ♂. Nandi; March 16, 1898. *b*, ♂. Campi Rao, Nandi; March 14, 1898.

16. *M. VULGARIS*, *Butl.*.—*a*, *b*, ♂. Mondo, Chagwe; February 28, 1898.

17. *M. DENTATA*, *E. M. Sharpe.*.—*a*, ♂. Mondo, Chagwe; February 28, 1898.

18. *M. SAUSSUREI*, *Dewitz.*.—*a*, ♂. Mondo, Chagwe; February 28, 1898. *b*, ♂. Kzwiligoma, Uganda; February 27, 1898.

19. *M. PERSPICUA*, *Trim.*.—*a*-*c*, ♂ ♀. Campi Rao, Nandi; March 12-14, 1898.

20. *YPHIMA ALBIDA*, *Butl.*.—*a*, ♂. Usabara, Uganda; February 26, 1898. *b*-*d*, ♂ ♀.

21. *Y. DOLETA*, *Kirby.*.—*a*, ♀. Campi Rao, Nandi; March 14, 1898.

22. *Y. PUPILLARIS*, *Butl.*.—*a*, ♀. Campi Mauwi, Ukambani; August 16, 1897. *b*, ♂. Lubwa's Hill, Usoga; January 3, 1898.

23. *Y. ITONIA*, *Hewits.*.—*a*, ♂.

24. *NEOCENYRA GREGORII*, *Butl.*—*a*. Kiu Hills, Ukambani; April 19, 1898.

25. *APHYSONEURIA PIGMENTARIA*, *Karsch.*—*a-c*, ♂ ♀. Eldoma Ravine, Mau; March 20, 1898.

Family ACRÆIDÆ.

26. *ACRÆA SERENA* (*Fabr.*).—*a-d*, ♂. Campi Simba, Ukambani; August 15, 1897. *e*, ♀. Mbabani, Usoga; March 4, 1898.

27. *A. VINIDIA*, *Hewits.*—*a*, ♂. Mondo, Chagwe; February 28, 1898. *b*, ♀. Wakolis, Usoga; October 16, 1897.

28. *A. CABIRA*, *Hopff.*—*a*. Campi Pashto, Nandi; March 15, 1898.

29. *A. UVII*, *Grose-Smith.*—*a, b*. Campi Pashto, Nandi; March 15, 1898.

30. *A. ADMATHA*, *Hewits.*—*a*, ♂. Campi Rao, Nandi; March 14, 1898.

31. *A. PUDORINA*, *Stgr.*—*a*, ♂. Kiu Hills, Ukambani; April 19, 1898. *b*, ♂. Misongoleni, Ukambani; August 5, 1897. *c*, ♂. Derajemi, Ukambani; August 5, 1897.

32. *A. BEÆSIA*, *Godm.*—*a*, ♂. Makindo River, Ukambani; August 14, 1897.

33. *A. CÆCILIA* (*Fabr.*).—*a*, ♀. Muani, Ukambani.

34. *A. LYCIA* (*Fabr.*).—*a*. Lugumbwas, Chagwe; March 1, 1898. *b*. Mbabani, Usoga; March 4, 1898. *c*. Mtigwa, Usoga; March 5, 1898. *d*. Kibaoni, Ukambani; April 20, 1898.

35. *A. NATALICA*, *Boisd.*—*a*, ♂. Misongoleni, Ukambani; August 5, 1897. *b*, ♂. Lugumbwas, Chagwe; March 1, 1898. *c*, ♂. Wakolis, Usoga; March 4, 1898.

36. *A. ACARA*, *Hewits.*—*a*, ♂. Campi Rao, Nandi; March 14, 1898.

37. *A. EGINA* (*Cram.*).—*a, b*, ♂. Wakolis, Usoga; March 4, 1898. *c*, ♂. Campi Pashto, Nandi; March 15, 1898.

38. *A. OREAS*, *E. M. Sharpe.*—*a*. Campi Rao, Nandi; March 14, 1898.

39. *PLANEMA JOHNSTONI*, *Godm.*—*a*. Eldoma Ravine, Mau; March 22, 1898.

40. *P. LYCOA*, *Godt.*—*a*. Campi Rao, Nandi; March 13, 1898.

41. *P. NANDENSIS*, *E. M. Sharpe*; *Ann. & Mag. Nat. Hist.* (7) iii. p. 244 (1899).—*a*. Nandi; March 16, 1898. *b*. Campi Rao, Nandi; March 13, 1898.

42. *PARDOPSIS PUNCTATISSIMA* (*Boisd.*).—*a*. Kiboko River, Ukambani; August 14, 1897. *b*. Campi Mauwi, Ukambani; August 16, 1897. *c*. Wakolis, Usoga; October 5, 1897.

Family NYMPHALIDÆ.

43. *HYPANARTIA SCHŒNEIA* (*Trim.*).—*a.* Campi Darajemi, Nandi; March 18, 1898. *b.* Campi Aziwa, Nandi; March 19, 1898. *c.* Eldoma Ravine, Mau; March 20, 1898.

44. *PYRAMEIS ABYSSINICUS*, *Feld.*.—*a.* Campi Aziwa, Nandi; March 19, 1898.

45. *ATELLA PHALANTHA* (*Drury*).—*a.* Mbabani, Usoga; March 4, 1898. *b.* Campi Rao, Nandi; March 13, 1898. *c.* Kibaoni, Ukambani; March 20, 1898.

46. *ARGYNNIS HANNINGTONI*, *Elwes.*.—*a-c.* Campi Aziwa, Nandi; March 19, 1898.

47. *PSEUDARGYNNIS HEGEMONE* (*Godt.*).—*a, b.* Campi Rao, Nandi; March 14, 1898.

48. *JUNONIA CEBRENE*, *Trim.*.—*a, ♂.* Campi Daraja, Nandi; March 12, 1898. *b, ♀.* Makindo River, Ukambani; March 13, 1898. *c, ♂.* Kiu Hills, Ukambani; March 19, 1898.

49. *J. CLELIA* (*Cram.*).—*a-d.* Campi Pashto, Nandi; March 15, 1898.

50. *J. BOÖPIS*, *Trim.*.—*a, ♂.* Muani, Ukambani; August 18, 1897. *b, ♂.* Kiu Hills, Ukambani; April 19, 1898. *c, ♀.* Campi Daraja, Nandi; March 12, 1898.

51. *J. WESTERMANNI*, *Westw.*.—*a-d.* Campi Rao, Nandi; March 13-14, 1898.

52. *PRECIS SESAMUS*, *Trim.*.—*a, b.* Campi Rao, Nandi; March 12-14, 1898.

53. *P. NATALICA*, *Feld.*.—*a.* Muani, Ukambani; April 1, 1898. *b.* Campi Mauwi, Ukambani; April 22, 1898. *c.* Kiboko River, Ukambani; April 25, 1898.

54. *P. INFRACTA* (*Butl.*).—*a.* Mtigwa, Usoga; March 5, 1898. *b-d.* Campi Rao, Nandi; March 14, 1898.

55. *P. TEREIA* (*Drury*).—*a, b.* Wakolis, Usoga; October 15, 1897.

56. *P. ELGIVA* (*Hewits.*).—*a.* Nandi; August 24, 1897.

57. *P. PELARGA* (*Fabr.*).—*a, b.* Campi Pashto, Nandi; March 15, 1898. *c.* Campi Rao, Nandi; March 14, 1898.

58. *P. CALESCENS* (*Butl.*).—*a, b.* Campi Daraja, Nandi; March 12, 1898. *c.* Kiu Hills, Ukambani; April 19, 1898.

59. *P. GREGORII* (*Butl.*).—*a-c.* Campi Rao, Nandi; March 13, 1898.

60. *P. CŒLESTINA*, *Dewitz.*.—*a.* Campi Daraja, Nandi; March 12, 1898.

61. *P. ORTHOSIA* (*Klug.*).—*a-c.* Lubwa's Hill, Usoga; January 2, 1898.

(To be continued.)

CURRENT NOTES.—NO. 1.

By G. W. KIRKALDY.

- [1] R. F. SCHARFF: "Some Remarks on the Atlantis Problem"; 1903, Proc. Roy. Irish Acad., xxiv., Sect. B., pt. 3, pp. 268-302.
- [2] G. BREDDIN: Fauna Arctica, 1902, ii., pp. 529-60 [Rhynchota].
- [3] G. W. KIRKALDY: Fauna Hawaiiensis, 1903, iii., Hemiptera, pp. 99-174, pls. 4 and 5.
- [4] E. D. BALL: 1901, Ohio Nat., i., pp. 122-4, pl. x. [Rhynchota].
- [5] J. GULDE: "Die Dorsaldrüsen der Larven der Hemiptera-Heteroptera"; 1902, Ber. Senckenb. Naturf. Ges. Frankfurt, pp. 85-134, pls. 7 and 8.
- [6] W. E. HINDS: 1902, Proc. U. S. Nat. Mus., xxvi., pp. 79-242, pls. i.-xi. [Thysanoptera].
- [7] U. NAWA: "Notes on a Parasitic Moth"; 1903, The Insect World, vol. vii., no. 1, 2 pp., coloured plate.
- [8] E. P. FELT: 1902, Bull. N. York State Mus., no. 59 (Entom., no. 16), pp. 49-84, 1 coloured and 5 photo plates.
- [9] O. SCHMIEDEKNECHT; 1902, Opuscula Ichneumonologica, fasc. 1, pp. 1-80.
- [10] H. SCHOUTEDEN: 1902, Ann. Soc. Ent. Belg., xlvi., pp. 136-42 [Rhynchota].
- [11] A. W. MORRILL: 1903, Canad. Ent., xxxv., pp. 25-35, pl. 2 [Rhynchota].
- [12] W. H. HARRINGTON: 1903, Canad. Ent., xxxv., p. 37 [Hymenoptera].
- [13] A. F. CONRADI: 1902, N. Hampshire Agric. Exp. Sta., Bull. 94, pp. 89-92 [Coleoptera].
- [14] C. M. WEED: 1902, *op. cit.*, Techn. Bull., 5, pp. 139-79.

CLARENCE WEED has published a bibliography of the economic relations of North American Birds [14], the list of works being much increased in usefulness by a brief summary of contents after most of the entries.

W. E. HINDS has monographed the North American Thysanoptera [6]. Up to the middle of 1902, only twenty-six species had been described, of which sixteen are considered valid or properly known; these are now increased to thirty-four, embraced by twenty-two genera. The descriptions are detailed, and are preceded by analytical tables and extended remarks on the general structure of the order, development, economic importance, &c., and are concluded by a bibliography. A curious misprint, "phylogeny," occurs more than once, and a serious deficiency in the omission of generic references (now unfortunately too often the case in monographic or revisional work), nor is there any indication in the index as to new genera and species.

H. SCHOUTEDEN enumerates the root-inhabiting aphids of Belgium and their relations with ants [10].

E. D. BALL describes the food-habits of some American *Aphrophora* larvæ [4]. The larvæ of *A. 4-notata* are found on various plants and shrubs; those of *A. parallela* are recorded as forming frothy masses (like the allied *Cercopis* [= *Philænus*] in this and other countries) on the tips of pine twigs. The American author notes that the larvæ of *A. permutata*, a rocky mountain species, were found, not on the twigs of pines, but down among the roots, ten or fifteen in a clump, and supposes that the "original pine-inhabiting species, finding themselves unable to maintain their froth-masses in their exposed positions on pine-branches in such a dry atmosphere, were compelled to seek moister conditions, such as are afforded by the shade and contact with the earth under these bushy plants."

G. W. KIRKALDY has published [3] the part of his Rhynchotal contribution to the 'Fauna Hawaiensis' dealing with Coccidæ, Cixiaria, and Heteroptera; the Tetigoniidæ, Asiracinæ, and a small portion of the Heteroptera being reserved for further study. On p. 150 it is stated that the genus *Allæocranum* is represented for the first time. In 1899, however, it was figured in the *Biologia Centr. Amer.*, Rhynch. Heter., ii., pl. 12, f. 6; Kirkaldy's doubtful admission of Cuba as a locality for *A. biannulipes* may now be confirmed, as Champion has taken it (p. 197) in Panama, Bugaba, and records it from Dorei Island, New Guinea, and Dr. Puton informs the present writer that it has been taken in France.

G. BREDDIN enumerates the Rhynchota and Siphunculata of the Arctic Region [2], including in this term the lands north of the limits of the birch, fir, and larch trees. Among species of wide distribution, and occurring also in Britain, may be mentioned *Nysius thymi*, *Gerris odontogaster*, *Reduviolus lhesigus* (= *Nabis flavomarginatus*), *Acanthia littoralis* and *saltatoria*, *Tera-tocoris viridis*, *Agalliastes wilkinsoni*, &c. Lists are also given of the Rhynchota of Iceland and the Färöes. In the former, Breddin has overlooked the records by the writer of *Corixa carinata* from Hagvelta, near Störvaldir, and of *Acanthia littoralis* from Störvaldir (1899, *Revue d'Entom.*, p. 95).

E. P. FELT considers [8] the grapevine rootworm (*Fidia viticida*, Walsh, a coleopteron of the Chrysomelidæ) to be a much more serious enemy of the vineyardist than the grapevine leaf-hopper (*Erythroneura vitis*, Harris), for whilst the operations of the latter are confined to the leaves, and the amount of damage easily controlled, *Fidia* inflicts its most serious injuries underground, and in a great many instances a vine is nearly ruined before the trouble is noticed. "The secrecy of this insect's work, and the fact that the grubs operate on the large roots, where a small amount of girdling is fatal, constitute the most dangerous

features of this pest." Vines on rich clay-soils sustain comparatively little damage, but on light sandy or poor soil the depredations are much worse. *Fidia viticida* is a native American, and has long been known as a feeder on wild grapevines, &c., and it is only within the last few years that it has become notable as a pest of the cultivated vine. The beetle was first noticed in Kentucky in 1866, and was at the same time or soon after taken in Illinois and Missouri, and is now known from New York State to Florida, and from Texas to Dakota. The life-history and habits are closely worked out, and remedial measures discussed.

O. SCHMIEDEKNECHT [9] has issued the first fascicule of his new "Opuscula Ichneumonologica," containing analytical tables of the genera of six ichneumonid tribes and of the palæarctic species of the genus *Ichneumon*.

HARRINGTON [12] notes the capture of a male wasp (*Thyreopus latipes*, Smith) with female antennæ.

A. W. MORRILL [11] describes and figures a new species of *Aleyrodes* from strawberry, with details of life-history.

A. F. CONRADI [13] discusses "Remedies for Fleas": creolin being recommended.

J. GULDE [5] contributes an important paper on the dorsal glands in Heteropterous larvæ.

R. F. SCHARFF discusses [1] the Atlantis Problem, and concludes that Madeira and the Açores, up to miocene times, were connected with Portugal; that from Marocco to the Canary Islands, and from them to South America, stretched a vast land, which extended southward certainly as far as St. Helena. This great continent may have existed already in secondary times, and probably began to subside in early tertiary times. Its northern portions persisted until the miocene, when the southern and northern Atlantic became joined, and the Açores and Madeira became isolated from Europe. They again united with the Old World in more recent times, and were still connected in the early pleistocene with the continents of Europe and Africa, at a time when man had already made his appearance in Western Europe, and was able to reach the islands by land. These conclusions are reached by a study of all the animal classes, by no means least from the insects, which, in accordance with other groups, exhibit mostly South European or North African affinities. Among the forms omitted is the beautiful *Notonecta glauca* var. *canariensis*, peculiar, so far as is known, to the Canary Isles.

It has long been known that remarkable lepidopterous larvæ of the genus *Epipyrops*, Westwood (fam. Limacodidæ), live, either parasitically or commensally, on the living bodies of certain Fulgoridæ (Homoptera). Their nutriment is unknown, and the host is not destroyed by the visitor. The first notice was published in the Trans. Ent. Soc. Lond., 1876, pp. 519-24, pl. vii., on a

species from Hongkong which spins its cocoon in the waxy appendages of *Pyrops candelaria*. The following year (1877, pp. 433-7, pl. x., fig. c) appeared a further notice of what was considered to be the same genus on a species of *Aphæna*, and also on *Eurybrachys spinosa* (belonging to a different sub-family), both from India. Westwood supposed that the lepidopteron is actually parasitic, feeding on the waxy matter, but quotes Wood-Mason as considering that the former only uses the homopteron as a means of conveyance. Recently the 'Insect World,' a magazine usually appearing only in Japanese, has published two pages in English (accompanied by a coloured plate), entitled "Notes on a Parasitic Moth," by Miss U. NAWA [7]. In August, 1898, Mr. Y. Nawa discovered, "on Mt. Yoro, some curious larvæ covered with white substance, and living on the outside of the abdomen of *Pomponia japonensis*" (a Cicadid). After a few days they spun cocoons, from which moths issued identical with one captured six years previously by Miss Nawa on Mt. Kinkwa, near Gifu. The larvæ were, later on, found on *Pomponia maculaticollis* and *Graptosaltria calorata* (recte *colorata*). Similar larvæ were also found on the Fulgorid *Ricania japonica*. The moth in all its stages is described, but not identified. When full grown the body is covered with fine white hairs, which appear like a mass of cotton-wool. When full grown they leave their host, and move away to the trunks of trees or the leaves of plants, to spin their cocoons.

A LIST OF THE LEPIDOPTERA OF ROXBURGHSHIRE.

BY W. RENTON.

I FIND that, as regards the Macro-Lepidoptera, Roxburghshire is one of the best counties in Scotland. Altogether I have taken three hundred and thirty-five species, of which twenty-seven are butterflies.

Pieris brassicæ.—Generally very common from April to September; too common, in fact, for the kitchen-garden. The larvæ are also common on swede turnips.

P. rapæ.—Also a common species throughout the county.

P. napi.—Numerous, like the preceding species.

Euchloë cardamines.—Common, June, 1901; only a few occurred in June, 1902. I did not take this species until the former date.

Colias edusa.—Fairly common in June and July, 1900, throughout the county.

Argynnis selene.—A very local species on Jed Water, near Jedburgh; also on Malcolm's Moss, near Minto, June and September.

A. euphrosyne.—Rare on Malcolm's Moss and Borthwickbrae Moss, June.

A. aglaia.—Common on Rubers-law, Minto Rocks, Tweed banks, near Kelso, June and July.

A. paphia.—Some seasons common on Minto Rocks. This is the only locality where I have taken this species.

Melitæa artemis.—Local in Duke's Woods and Muirfield Woods, both places near Hawick, end of June.

Vanessa urtica.—Generally common throughout the county.

V. io.—This species is now becoming extremely rare; only a few species taken annually near Jedburgh.

V. antiopa.—I took one example of this rare species near Caver's House, Aug. 27th, 1900. I also had the pleasure of seeing another near Greenlaw, Berwickshire, September, 1896.

V. atalanta.—Very uncertain in its appearance; some seasons it is very common, while in others not a specimen is to be seen. Larvæ found on the stinging-nettle.

V. cardui.—Much like the preceding species in general. Larvæ found on various thistles and on burdock.

Erebia blandina.—Local in the south-west of Roxburghshire, Muirfield Woods, Kirton Moor, Borthwickbrae. This is a variable species. The larva is full grown in July, and found on all grasses where the insect occurs.

Pararge egeria.—One specimen near Ormeston Mains, Teviot, May 5th, 1901.

Satyrus semele.—The only locality known to me for this species is near Hawick Station, where it is fairly common.

Epinephele ianira.—Common all over the county, June to August.

Aphantopus (E.) hyperanthus.—A rather local species throughout the county. Var. *arete* occurs commonly. Some of the specimens are absolutely devoid of ocelli. Larvæ on grasses in June; imago in July.

Cenonympha dorus.—Found only in one locality on Reidfordgreen Moss, in June.

C. pamphilus.—One of the commonest of insects throughout the county.

Chrysophanus (Polyommatus) phlæas.—A rather rare and local species in general, occurring from June to October. I have bred this species, feeding the larvæ on sorrel.

Lycæna astrarche (agestis) var. artaxerxes.—Common near Hawick, Jedburgh, and Ancrum, found on grass banks in June and July.

L. minima (alsus).—Local, but common where it occurs in May and June.

L. icarus (alexis).—Another common species from June to September (second brood). Some fine varieties of this species are obtained in this county.

Adopæa (Hesperia) sylvanus.—I had a specimen brought to me by a boy last July; he took it when going to school, near Hawick. This was the first specimen recorded from this county to my knowledge.

Acherontia atropos.—A few annually in August throughout the county. Larvæ are found on potato, and in some seasons are fairly common.

Sphinx convolvuli.—Occurs more rarely than the preceding species. Specimens have been taken at Jedburgh, Hawick, and the larva found at Ednam, August, 1900.

S. ligustri, *Chærocampa porcellus*, and *Smerinthus ocellatus*.—Only a single example of each of these species has been taken in the county to my knowledge.

Smerinthus populi.—A rather common species in general. Larvæ are common on willows and sallows in August.

Macroglossa stellatarum.—In some seasons fairly common; abundant in 1900 and 1901. Larvæ in June and September, on bedstraw.

Trochilium crabroniformis (*bembeciformis*).—I have never taken the imago of this species, but larvæ are of frequent occurrence on Rubers-law, Jedwater, and Malcolm's Moss in May, in sallows.

Sesia tipuliformis.—I took one specimen in my garden on July 3rd, 1900.

Ino (*Procris*) *statices*.—Local in Duke's Woods end of June and July.

Sarothripus undulatus.—When collecting at sallows, near Kirton School, in April, 1901, a hibernated specimen was obtained.

Hylophila prasinana.—Rare near Kelso and Minto Woods, July and August.

Nudaria mundana.—Common everywhere in the county; larvæ on stone walls and also on lichen in hedgerows, April and May.

Gnophria rubricollis.—Larvæ were obtained last season (September) in Denholm Dene, on old elm trees.

Euchelia jacobææ.—One or two taken annually in the eastern portion of the county. I have never found the larva except on the coast.

Diacrisia (*Nemeophila*) *russula*.—This insect is now getting very rare on all the moors; burning the heather has something to do with this.

Parasemia (*N.*) *plantaginis*.—Occurs locally up and down the county; the variety *hospita* is also found. Larvæ are full grown in May, and are found on plantain.

Arctia caia.—At one time common, but getting extremely rare during the last few years.

Spilosoma fuliginosa.—More or less common everywhere in May and June. I have never taken the second brood. Larva in April; a general feeder.

S. mendica.—Has only been taken near St. Boswell's Station, in June. I believe that this species was first noted in the county by Mr. H. Dodds, of Galashiels, who captured a specimen in 1900.

S. menthastris.—Common everywhere from May to August. The larvæ are common in August and September on various plants.

Hepialus humuli, *H. sylvanus*, *H. velleda*, *H. lupulinus*, *H. hectus*; all more or less common throughout the county; also var. *carnus* of *H. velleda*.

Dasychira fascelina.—Common on Rubers-law, Kirton Moor, Shieldswood, and Muirfield, in June and July. Larvæ April to June, on heath.

Orgyia antiqua.—Very local in Wells Woods and Springwood Park Wood in August. I have found the larvæ on hazel.

Trichiura cratægi.—Another very local species. It occurs on Shieldswood Moors and Muirfield, in September. Larvæ found in May.

Pæcilocampa populi.—Odd specimens taken annually near Hawick. Beat the larva from thorn in June.

Macrothylacia (*Bombyx*) *rubi*.—Fairly abundant in many localities

in June, but difficult to capture. Larvæ common from July to March, on moors and pastures.

Lasiocampa (B.) quercus var. *callunæ*.—Rather local on Rubers-law and other good moors in July. Larvæ are full fed in July, on heath.

Saturnia pavonia.—Much more widely distributed than the preceding species, on moors and bogs, April and May. Larvæ found on heath, sallows, &c., in August.

Drepana falcataria.—From one locality only in Springwood Park Woods, June.

Cilix glaucata.—Common in the district of Hawick only, in June. Bred the imago from larvæ collected in August, on whitethorn.

Dicramura furcula.—More or less common in the larval stage in August, but the imago is very rarely found.

D. vinula.—This species appears to be generally scarcer than the preceding.

Pterostoma palpina.—Collected the larvæ from sallows, in August, on Edderstone-lea Moss.

Lophopteryx camelina.—Found at rest on oak, birch, willow, &c., in June. This species is well distributed throughout the county.

Pheosia (Notodonta) dictæa.—Very rare and local near Hawick and Jedburgh. The imago occurs in July, and the larva is found on poplar in August and September.

P. (N.) dictæoides.—Found the larva in August, on birch, in Adderstone-lea Moss and Cavers Woods.

Notodonta dromedarius.—Rather a common species in general throughout the county. The larva on birch and alder in August and September.

N. ziczac.—Another species that is common in the larval stage on sallows in August.

N. chaonia.—Found a female specimen on an oak-trunk on May 27th, 1900, near Hawick. The only specimen that I have taken of this species.

Phalera bucephala.—Local; on lime trees in larval stage, in August and September.

Pygæa pigra.—From one locality only in Newfield Moss, near Hawick, June.

Thyatira batis.—Occurs in June. It is a common and widely distributed species, and is generally the first moth that comes to sugar in the evening.

Cymatophora duplaris.—Taken only in one locality, Hagburn Glen, in June. The larva on birch in August.

Asphalia flavicornis.—Also a rare species and local, occurring near the gamekeeper's house, Wells, in April.

Bryophila perla.—Local on stone walls, June, near Hawick, Kelso, and Ancrum.

Demas coryli.—Occurs in June; I have specimens from the eastern portion of the county only. The larva is found on hazel in August.

Acronycta tridens.—Bred two specimens from three larvæ taken near Kelso in August.

A. psi.—More or less common throughout the county in June and July.

A. ligustri.—Of more rare occurrence, some seasons fairly common at sugar in June. Larvæ on ash in August.

A. rumicis.—Generally common.

A. menyanthidis.—A local species, occurring on Muirfield and Snnlaw Moss in June. Larvæ on heath in August.

Diloba cæruleocephala.—Have not seen this species since 1899, when it was common.

Leucania conigera, *L. lithargyria*, *L. comma*, *L. impura*, *L. pallens* (with the red form).—Generally common.

Tapinostola fulva.—Common on all the moors and bogs in August.

Calamia lutosa.—The only locality known to me is Semiston Moss, near Kelso.

Hydræcia nictitans.—Common on thistles in August and September, the var. *erythrostigma* well represented.

H. micacea.—A few specimens annually, on ragwort, in August. Rare in general.

Xylophasia rurea.—Common; also the variety *alopecurus*.

X. lithoxylea.—Less common than the preceding species.

X. monoglypha.—Common every year. Varies in colour from light grey to black.

X. hepatica.—Appears to be a local species in this county.

Neuronia popularis.—One specimen at Deanbrae in August, 1899.

Charæas graminis.—Common everywhere in August.

Cerigo matura.—A few specimens annually in July.

Luperina testacea.—Local; in the Hawick district only.

Mamestra furva.—Generally common throughout the county, July and August.

M. brassicæ.—Of more rare occurrence in gardens.

Apamea basilinea.—Common everywhere.

A. gemina.—More local than the preceding, but common where it occurs.

A. didyma.—Common and variable.

Miana strigilis, *M. fasciuncula*, *M. literosa*, and *Petilampa (M.) arcuosa*, are all more or less common.

Celæna haworthii.—Found on all the mosses where the cotton-grass grows.

Stilbia anomala.—From one locality only, Ettrick-head, July and August.

Caradrina morpheus.—I only took this species last July, when collecting at white campion, near Hawick.

C. taraxaci.—A few specimens of this widely distributed species are taken each year in July.

C. cubicularis.—Common in barns and outhouses, &c., from April to September.

Rusina tenebrosa.—Common everywhere.

Agrotis suffusa.—Common near Kelso in August.

A. saucia.—One example at sugar in Duke's Woods, near Hawick, September, 1899.

A. segetum.—Common in 1897, but has not been seen since, at least by me.

A. exclamationis.—Common annually everywhere.

A. nigricans.—A few specimens only in 1899, on ragwort.

A. tritici.—One specimen only, near Kelso.

A. agathina.—Common in larval stage on all the good moors. Very difficult to rear.

A. porphyrea.—Common on all moors.

Noctua glareosa.—Of frequent occurrence on the borders of moors in August.

(To be continued.)

NOTES AND OBSERVATIONS.

THE NATIONAL COLLECTION OF BRITISH LEPIDOPTERA.—The rearrangement of the British Lepidoptera in the Natural History Museum at South Kensington is progressing; that of the families Arctiadae and Noctuidae being now complete so far at least as the material at present available in the Museum permits. A list of desiderata is subjoined in the hope that our readers may be disposed to assist in perfecting the collection, and making it really illustrative of the lepidopterous fauna of Great Britain.

SPECIALLY WANTED.—*Lithosia sericea*, Gregs., *Nudaria senex*, *N. mundana*, *Noctua depuncta*, *N. sobrina*, *Dianthæcia luteago* vars. *barrettii* and *fickleni*, *D. cæsia*, *Pachetra leucophæa*, *Leucania favicolor*, Barr., *L. albipuncta*, *L. loreyi*, *L. putrescens*, *L. vitellina*, *Cucullia gnaphalii*, *C. scrophulariæ*, Esp., *Polia xanthomista*, *Xanthia ocellaris*, *Cerastis erythrocephala*, *Hadena porphyrea* (*satura*), *Caradrina ambigua*, *Hydrilla palustris*, *Petilampa* (*Miana*) *arcuosa*, *Tapinostola elymi*, *Synia musculosa*, *Luperina dumerilii*, *Laphygma exigua*, *Cænobia rufa*, *Nonagria geminipuncta*, *N. cannæ*, *N. sparganii*, *Plusia ni*, *Catephia alchymista*, *Micra ostrina*, *paula*, and *parva*.

LOCAL FORMS AND ABERRATIONS.—*Lithosia depressa*, *Emydia cribrum*, *Spilosoma lubricipeda*, *S. menthastri*, *S. mendica*, *Parasemia plantaginis*, *Arctia caia*, *Agrotis segetum*, *A. vestigialis*, *A. corticea*, *A. cinerea*, *A. cursoria*, *A. nigricans*, *A. tritici*, *A. exclamationis*, *Pachnobia hyperborea*, *Noctua festiva*, *N. glareosa*, *N. castanea*, *N. baja*, *N. brunnea*, *N. dahlii*, *N. xanthographa*, *Agrotis agathina*, *Dianthæcia nana*, *Hadena dentina*, *H. glauca*, *H. thalassina*, *Panolis piniperda* (green form), *Teniocampa gothica*, *T. munda*, *T. stabilis*, *T. gracilis*, *T. opima*, *T. incerta*, *Charæas graminis*, *Leucania lithargyria*, *Heliophobus hispidus*, *Dryobota protea*, *Polia chi*, *Cleoceris viminalis*, *Aporophyla lutulenta*, *A. australis*, *Xanthia aurago*, *Orthosia rufina*, *O. suspecta*, *Anchocelis lunosa*, *A. pistacina*, *Cerastis vaccinii*, *C. ligula*, *Xylophasia rurea*, *Hadena adusta*, *Mamestra abjecta*, *Apamea nictitans*, *Celænea haworthii*, *Miana bicoloria*, *M. strigilis*, *Bryophila muralis* and *perla*, *Sarrothripa revayana*.

Ova, larvæ, and pupæ of almost any species would also be very useful.

PUPA OF VANESSA POLYCHLOROS ATTACKED BY PARASITES.—I was very interested in reading Mr. Mathew's note on *Vanessa polychloros* (*ante*, p. 99), as I was myself thinking of writing about my experiences with this insect, which differ considerably from his. I used to think that after a lepidopterous insect had passed its larval state without getting

stung it was immune from any further attacks of parasitic flies, but this, at any rate, does not seem to be the case with *V. polychloros*. In June, 1901, while cycling in this neighbourhood, I came across a large nest of the larvæ of this insect on sallow growing by the roadside. Although fairly grown—in fact, getting ready for the final moult—I managed to take sixty-two home in some chip-boxes I had with me. Sixty of these pupated, the other two dying from some unknown cause. The same month I found a fine large pupa of this species on an out-building near some elm trees; on proceeding to take it, I noticed two or three little flies crawling over it, which made me think they were emerging from it, but the pupa proved to be alive by violently kicking on my touching it. I also took three larvæ that were crawling about on the same building seeking suitable places to suspend themselves; these soon after pupated. From these sixty-four pupæ sixty-three imagines were bred, one only proving to be stung, being the one I took in the pupal state; from this a swarm of little flies emerged. Last year, *V. polychloros* being again common, my father and I took a few more larvæ that were about to change; these all reached the perfect state. Many of the others that were left hung themselves up under the eaves of some out-houses; these I watched. One in particular suspended itself low down where I could easily observe it. One morning I found that it had cast its larval skin either in the night, or earlier that day, and on my looking at it again that same morning I noticed one of the little flies, similar to those that had emerged from the pupa I took the previous year, crawling about for a considerable time all over it, and, as I suppose, laying its eggs, for on magnifying it, I saw that its ovipositor was protruding and touching the surface of the pupa. This was the first of the "wild" ones I was watching to pupate, and, like the majority of them, proved to be stung. I may add that all the pupæ obtained were kept indoors. *V. polychloros* has appeared again this year, one being seen on April 3rd.—J. F. BIRD; "The Lodge," Cowfold, Sussex, April 6th, 1903.

LARVÆ AT SUGAR.—On August 29th last, when visiting some sugared posts on our sandhills, I found a full-grown larva of *Agrotis ripa* busily engaged 'sucking' the bait. I watched it for some time, and there was no doubt that it was thoroughly enjoying itself. In the woods a few miles from here I have frequently seen larvæ of *Lithosia griseola* on sugared trees in early summer, and on one particular tree a larva came for several nights during a period of ten days. This was probably the same individual. On the coast sandhoppers are sometimes quite a nuisance, the patches of sugar being completely smothered with them.—GERVASE F. MATHEW; Dovercourt, Essex, April 16th, 1903.

NOTE ON *POLIA SERENA*.—Last autumn I obtained about a hundred larvæ of this pretty moth from the flowers of *Crepis virens*. They were placed in a large tin breeding-cage, half full of earth, in which were plunged two bottles to hold fresh food, and in due course they became full-grown, and buried, and the box was deposited upon a shelf in my breeding shed. One night last month a cat managed to get into the shed, and knocked the box off the shelf, and it fell to the ground on its side, and its contents were well shaken up. In trying to replace things as well as I could in their original position, I came across

several cocoons. One of these I opened to look at the pupa, but discovered nothing but the shell of the pupa full of a mass of pinkish-grey powder. I opened another cocoon, and with the same result; so I then looked at the remainder, and to my disgust found that they were all in the same condition—there was not a living pupa among them. One or two of the cocoons contained shrivelled up larvæ, but all the others were in the same state as the first one. Has anyone had a similar experience with this species?—GERVASE F. MATHEW; Dovercourt, Essex, April 16th, 1903.

THE ATTITUDE OF HYBERNATING *VESPA OCCIDENTALIS*: A COMPARATIVE STUDY.—The article by F. W. Frohawk on the "Attitude of Hybernating Wasps" in the February 'Entomologist' interested me to investigate the circumstances attending the hybernation of our California species of wasp, *Vespa occidentalis*. The following is offered as a study for comparison. On March 6th I made observations on the bark of the blue-gum, a species of *Eucalyptus*, and found in the loose bark of this tree about a dozen specimens of hybernating wasps in a good state of preservation. The wasp rested with feet on the inside of bark, generally on thickest portions of loose bark, and almost invariably on the north side of the tree. The wings were not flat against the bark, except at end of abdomen where they protruded, and held between posterior legs and abdomen. The legs were under the wings, with the feet flat against the bark. The middle legs did not touch the bark, for the body was so humped as to rest on the front and hind legs. The head was lowered, with the antennæ curved about the neck between head and forelegs. They were perfectly dry and pliable, without any trace of a secretory fluid to hold them in place. The body was covered with beads of moisture, the largest beads being on the ventral side of the abdomen. The jaws were not fastened. They were wide apart, the mandibles slightly piercing the wood, but very readily relaxed their hold when the bark was inverted. This species under normal circumstances hybernates under ground, but owing to the rainy season (we have nearly all the rain of the year during the winter in California) the insect must seek a dry shelter, and the loose bark of the *Eucalyptus* offers an ideal refuge. The reason that the insect, in seeking a place for hybernation, selects the north side of the tree is, I presume, to protect itself from being irritated by the sun's rays. The winters here are exceedingly mild; the average annual minimum temperature is 32.1° , and the lowest temperature ever recorded is 24.9° .—M. METZMAIN; Dept. of Entomology, University of California, Berkeley, California, March 7th.

URTICATING LARVAL HAIRS.—Referring to Mr. Carter's note (*ante*, p. 68) on the irritating properties contained in the hairy coats of "Bombyces," I can speak feelingly, as I was terribly punished when dealing with the larvæ and the cocoons of *P. chrysorrhæa*. I received a large nest of larvæ from my old friend Mr. Hargreaves, taken at Hove (near Brighton), and knowing by previous experience the effect of *P. auriflua* and *B. quercus*, I was most careful not to handle them; but if I only opened the cage to put in fresh food, I found the effect on my wrists, between my fingers, &c., and when the moths were

emerging I was very badly punished several times, my eyes and neck suffering most; in fact, I got so annoyed that I turned the lot out into the garden, opened the cage-door, and let them all go. It was my first, and I think it will be my last, attempt at rearing that species.—W. E. BUTLER; Hayling House, Oxford Road, Reading, March 15th, 1903.

ERASTRIA FUSCULA.—The food-plant of the larvæ of *Erastria fuscula* is without the slightest doubt *Molinia carulea* in Devonshire. I first became acquainted with the fact in September, 1873, and my note on the subject will be found in the 'Entomologist,' vol. vii. p. 185 (August, 1874). In that note it will be seen that I searched the bramble, afterwards ferns and heath, and not finding it, turned my attention to sweeping the undergrowth, and in the first hour obtained about a dozen. The question then became, what was the food-plant? and on careful search over the herbage swept, found it on a coarse grass, which proved to be *Molinia carulea*. After that I collected them without any trouble feeding about halfway up the blade of grass, taking them in September several years following.—G. C. BIGNELL, F.E.S.; Saltash, Cornwall, April 4th, 1903.

CAPTURES AND FIELD REPORTS.

ABNORMAL APPEARANCE OF NOOTUÆ.—Whilst sugaring at Boscombe with Major Robertson on March 21st, we took a fine specimen of *Hadena chenopodii*, evidently freshly emerged. The next night, March 22nd, Major Robertson's son took *Agrotis segetum* at sugar in good condition, apparently not hybernated. *Phlogophora meticulosa* was also common at sugar, and that they are this year's emergences is confirmed by Prof. Meldola taking a specimen drying its wings on March 26th.—J. A. FINZI; 53, Hamilton Terrace, N.W.

NOTE ON PUPE OF NONAGRIA TYPHÆ.—When hunting for pupæ of this species, I find the old previous year's dead stems by far the best place for them, and have taken as many as seven or eight pupæ from one stem.—GERVASE F. MATHEW; Dovercourt, Essex, April 16th, 1903.

SPRING LEPIDOPTERA AT WALLINGTON.—In our neighbourhood here the season has started very well, insects being both plentiful and varied. Of course the salallows have been the most productive, and all those within easy distance were visited, the following being the insects obtained :—*Panolis piniperda*, *Pachnobia rubricosa*, *Tæniocampa gothica*, *T. incerta*, *T. munda*, *T. gracilis*, *T. pulverulenta*, *T. stabilis*, *Orrhodia vaccinii*, *Scopelosoma satellitia*, *Hoporina croceago*, *Selenia bilunaria*, and *Larentia multistrigaria*. The gas-lamps have proved very attractive, and yielded *Tæniocampa incerta*, *T. gothica*, *Xylocampa lithorhiza*, *Selenia lunaria*, *S. bilunaria*, *Phigalia pedaria*, *Biston strataria*, *Hybernia marginaria*, *H. leucophæaria*, and *Anisopteryx æscularia*. Among larvæ, *Triphæna ianthina* has been swarming everywhere, and a good many *Apamea ophiogramma* have been taken from the ribbon-grass. Many others of all sorts have been captured, but I have not had time to get

them named yet. Sugaring has only so far produced *Scopelosoma satellitia*; whilst of butterflies the only three noticed have been *Gonepteryx rhamni*, *Pieris rapæ*, and *P. napi*.—LESLIE H. MOSSE-ROBINSON; Wandle Bank, Wallington, Surrey, April 15th, 1903.

NOTES ON COLEOPTERA COLLECTED IN 1902.—The greater part are from the New Forest between June 7th and 22nd, the remainder being nearly all from Surrey and Kent, in the vicinity of Croydon and Westerham. Two days, Easter Sunday and Monday, were spent at Westerham and Hever, but few species were taken, as I did not devote much time to beetles then. Whit Monday (May 19th) was spent in Surrey, near Farley and Chelsham, but the weather was very cold and wet. Aug. 4th was spent in nearly the same neighbourhood, when rather finer but dull weather was experienced.

The following is a list of captures, all being from the New Forest, except where otherwise stated:—

Cicendela campestris, *Carabus glabratus*, *C. catenulatus*, *Calosoma inquisitor*, *Notiophilus biguttatus*, *Leistus spinibarbus*, *Nebria brevicollis* (everywhere), *Bembidium gilvipes*, *B. lampros*, *B. brunnipes*, *B. tibiale*, *Pterostichus versicolor*, *P. lepidus*, *P. niger*, *P. nigrita*, *P. madidus* (everywhere), *Pristonychus subcyaneus*, *Calathus melanocephalus* (Cudsham), *Anchomenus albipes*, *A. oblongis*, *Demetrias atricapillus* (Chelsham), *Dromius linearis*, *D. agilis*, *Harpalus ruficornis* (everywhere), *H. ignavus*, *Pelobius hermanni*, *Hydroporus gyllenhalli*, *H. erythrocephalus*, *H. planus* (New Forest and Wimbledon), *H. melanocephalus*, *H. nigrita*, *Ilybius fuliginosus*, *Agabus bipustulatus*, *A. chalconotatus*, *Philhydrus marginellus*, *Helochares lividus*, *Hydrochus elongatus*, *Sphæridium scarabæoides*, *S. bipustulatum*, *Cercyon melanocephalus*, *C. analis*, *Necrophorus mortuorum*, *Silpha atrata*, *Leptusa fumida*, *Microglossa nidicola* (Downe), *Aleochara brevipennis*, *A. lanuginosa* (New Forest; Wimbledon), *A. nitida*, *Myrmedonia canaliculata*, *Oxyptoda lividipennis*, *Homalota gregaria*, *Tachinus rufipes*, *Tachyporus solotus*, *T. chrysomelinus*, *Conurus littoreus*, *Bolitobius atricapillus*, *Quedius impressus* (Chelsham), *Q. tristis*, *Ocypus olens* (Hever), *Philonthus varius*, *P. agilis*, *Baptolinus alterrans*, *Pæderus littoralis*, *Stenus speculator*, *S. similis* (Warley and New Forest), *S. tarsalis*, *Oxytelus rugosus*, *O. laqueatus*, *Olibrius consimilis* (near Westerham), *Coccinella 11-punctata* (Chelsham), *C. 7-punctata* (Chelsham), *C. occellata*, *C. 18-guttata* (Kent), *C. 14-guttata* (Kent), *Hister unicolor*, *H. carbonarius*, *Brachypterus urticae*, *Meligethes rufipes*, *M. viridescens* (Kent and Surrey), *Epurea æstiva*, *Omosita discoidea* (near Brasted), *Cryptophagus scanicus*, *C. patrielis*, *Scaphisoma agaricinum*, *Scaphidium quadrimaculatum*, *Byrrhus pilula*, *Parnis prolifericornis*, *Lucanus cervus*, *Onthophagus nuchicornis*, *Aphodius fossor*, *A. fætans*, *A. fimetrarius*, *A. granarius*, *A. putridus*, *A. sticticus*, *A. tristis*, *A. quadrimaculatum*, *A. depressus*, *Geotrupes typhæus*, *G. stercorarius*, *G. spiniger*, *Phyllopertha horticola*, *Cetonia aurata*, *Elatér sanguinolentus*, *Melanotus rufipes*, *Athous hamorhoidalis* (everywhere), *A. vittatis*, *Corymbites quercus*, *C. holeosericeus*, *Agriotes sobrinus*, *A. pallidulus* (everywhere), *Serricosomus brunneus*, *Dolopius marginatus* (everywhere), *Camptylus linearis*, *Helodes minutus*, *Cyphon coarctatus*, *Telephorus alpinus*, *T. rusticus*, *T. pellucidus*, *T. nigricans*, *T. bicolor*, *T. fulvus*, *T. testaceus* var. *limbatus*, *T. pallidus*, *Malthinus fasciatus*, *Malachius bipustulatus*, *Dasytes plumbeo-niger*, *Tillus*

elongatus, *Anobium domesticum*, *A. paniceum* (in store-box), *Clytis arietis*, *C. mysticus*, *Mesosa nubila*, *Rhagium inquisitor*, *R. bifasciatum*, *Toxotus meridianus*, *Anoploclera sexguttata*, *Grammoptera tabacicolor*, *G. ruficornis*, *Donacia linearis*, *D. sericea*, *Lema cyanella*, *L. melanopa*, *Cryptocephalus aureolus*, *Chrysomela polita*, *C. didymata*, *Lina populi*, *Gonioctena viminalis*, *Phædon tumidulum* (Farley and New Forest), *P. cochlearia*, *Pras-couris aucta*, *Adimonia caprea*, *A. sanguinea*, *Galeruca viburni*, *Luperus betulinus*, *L. flavipes*, *Hermeophaga mercurialis* (near Farley), *Crepidodera transversa* (near Selsdon Park), *C. aurata*, *Aphthona cærulea*, *A. venustula*, *Phyllotreta atra*, *P. nemorum* (Farley), *Plectroscelis concinna* (Farley), *P. aridella*, *Thyamis lurida*, *T. thoracica*, *T. melanocephala*, *T. pusilla* (Westerham), *Helops striatus* (everywhere), *Lagria hirta* (New Forest and Westerham), *Asclera cærulea*, *Anaspis frontalis*, *A. forcipata*, *A. fasciata*, *A. ruficollis*, *A. thoracica*, *A. subtestacea*, *A. melanopa*, *Rhyncites æquatus*, *Apion striatum*, *A. difforme* (Surrey), *A. flavipes* (Kent), *A. ervi*, *A. loti*, *A. miniatum*, *A. frumentarium*, *A. violaceum* (everywhere), *Cneorrhinus exaratus*, *Trachyphlæus spinimanus*, *Strophosomus coryli* (New Forest and Westerham), *Barypeithes brunnipes*, *Phyllobius pyri*, *P. alneti*, *P. argentatus*, *P. maculicornis*, *P. pomonæ*, *Otiorrhynchus picipes*, *O. ovatus*, *Sitones puncticollis* (Farley), *Hylobius abietis*, *Orchestes fagi*, *Caliodes quadrimaculatus* (everywhere), *Amalus scortillum*, *Rhinonchus pericarpus* (near Selsdon Park), *Balaninus glandium*, *B. villosus*.
—NORMAN L. GILLESPIE.

NOTES ON THE LEPIDOPTERA OF THE HARWICH DISTRICT, 1902.—I think it will be generally admitted that the season of 1902 was a poor one for both perfect insects and larvæ, yet, in some respects, it was a remarkable one in this district; for while many of our most common species were almost entirely absent, or very scarce, others were more than usually abundant in both their stages. Of our butterflies, the common whites (*Pieris brassicæ*, *rapæ*, and *napi*) were rarely seen, *Euchloë cardamines* was scarce, as were also the hibernated *Vanessids* in the spring, and fresh specimens in the autumn, but the larvæ of *Vanessa polychloros* were very plentiful, as I have recorded elsewhere, although the perfect insects were not noticed afterwards. Two or three worn *Pyrameis cardui* were seen in June, and several fresh ones in August and September. *Colias edusa* was seen on August 9th and 22nd, and one was captured on September 16th and one on 17th. *Lycæna argiolus* was tolerably numerous in the spring, but the autumn brood was scarce, very late, fresh-looking butterflies being seen up to September 17th, and larvæ only about half grown were beaten from ivy on November 7th. *Chrysophanus phlæas* I did not see once during the year, though I kept a careful look-out for it, as I wanted a female for eggs. At the end of May and beginning of June the larvæ of *Thecla quercus* and *Tæniocampa cruda* were more numerous than I ever remember, dozens falling into the umbrella at every blow of the beating-stick, but they were not accompanied by the usual hosts of larvæ of *T. stabilis*, *Cheimatobia brumata*, *Hybernia defoliaria*, *H. leucophæaria*, &c., which are such pests in most seasons. Searching for larvæ with a lantern at night, or beating undergrowth, in April and beginning of May, was not very productive, the only species in any numbers being *Triphæna fimbria*. When full grown,

these large fat larvæ are very easily seen as they crawl up long shoots of Spanish chestnut, the opening leaves of which are a special attraction to them. Larvæ of *Noctua triangulum*, *N. baja*, and *N. brunnea*, usually common, were very scarce, and I only beat one of *Aplecta nebulosa*. At the end of May and beginning of June *Eupithecia dodoneata* was taken rather commonly from trunks and branches of evergreen oak, but it is a very local species here. At the beginning of June a few larvæ of *Pseudoterpna pruinata* were beaten from broom, also a few of *Chesias spartiata*, a species generally very abundant. At the same time a few larvæ of *Xylophasia scolopacina* were swept after dark from grass growing in shady places in woods, but most of these were stung, and only about a dozen moths bred. Larvæ of *Leucania straminea*, usually full grown about the middle of June, were still small on the 23rd of the month, and apparently very scarce; a few full grown were taken towards the end of the month, but these were nearly all stung, as is generally the case with late larvæ of this species. From the middle to end of July *Mamestra abjecta* was met with on the coast in goodly numbers, feasting on the blossoms of marram grass, and continued to visit this attractive bait, or sugar, until the end of August. It is a species that gets worn very quickly, and should consequently be taken as soon as possible after emergence. A few *Senta maritima*, with three of the var. *bimaculata* and one of var. *nigrostriata*, were taken among reeds in July. This is an insect that keeps out for a long time, for I have taken it from middle of June to middle of August. *Agrotis nigricans* was beaten in numbers from lime blossom early in August, and on 11th and 12th of the same month nearly two hundred pupæ of *Nonagria geminipuncta* were taken from reed stems. On the latter date I received a larva of *Acherontia atropos* from Margate, the only one noticed this year, and this produced a fine moth on October 31st. *Heliothis armigera* was seen on September 1st, and on the 2nd fifty pupæ of *Nonagria typha* were taken from the stems of bulrushes, but it was rather late for them, for several empty pupa-cases were found, and one moth emerged on the way home. On the 7th of the same month *Cucullia asteris* was bred, which was remarkably late, as on that day I obtained thirty-seven of the larvæ, some of which were full grown. A few larvæ of *Pyrrhia* (*Chariclea*) *umbra* were found on *Ononis* in August and September, chiefly by searching with a lantern at night, as they were then sitting quite exposed on the highest stems of their food-plant. Beating oaks on the outskirts of woods and bushes in hedges for larvæ in August and September was a miserable failure, as scarcely any could be obtained that way, though some autumn larvæ were very abundant in other places. Those of *Hadena oleracea* simply swarmed on the tamarisk growing on the slopes facing Dovercourt Bay, and when full grown were to be seen in hundreds high up on the bushes, while others were constantly crossing the pavements and paths, and scores were trodden under foot. The beautiful larvæ of *Cucullia asteris* were very numerous on *Aster tripolium* by the sides of ditches in the salt marshes; the conspicuous larvæ of *Hadena pisi* were equally plentiful on broom, the pretty larvæ of *Polia serena* were numerous on flowers of *Crepis virens*, while those of *Emmelesia unifasciata* must have been in prodigious numbers on the flowers and seeds of *Bartsia*, judging from the quantity I gathered in three small

bundles of the plant early in September. These were placed in three handboxes, with a part of their lid cut out, and muslin substituted. In a day or two the larvæ began to appear on the muslin, and continued to do so until the middle of October, by which time I had transferred no less than four hundred and seventy-seven into two of my breeding-cages.—GERVASE F. MATHEW (Paymaster-in-Chief, Royal Navy); Dovercourt, Essex, March 19th, 1903.

NOTES ON COLLECTING LEPIDOPTERA DURING 1902.—In these notes I do not intend to deal with all the species taken during the year, but only with the more interesting captures.

"Sugaring," which is usually the most profitable mode of collecting Lepidoptera, was, I think, this year, the least productive; March, October, and November were the only months in which moths were attracted in anything like the usual numbers.

In March *Teniocampa populeti* and numerous hybernated Noctuæ were attracted; and in October and November *Cerastis vaccinii*, *Orthosia lota*, *Calocampa exoleta*, *Gonoptera libatrix*, and many others, were attracted; while a few very favourable evenings in June produced *Cymatophora or*, *C. duplaris*, and *Grammesia trilinea* in very small numbers.

This scarcity of moths at "sugar" was, I think, due to honeydew having been so general. By working honeydewed bushes—which stood somewhat isolated—with a lantern, I took *Hydræcia micacea*, *Miana literosa*, *M. bicoloria*, *Caradrina morpheus*, *C. taraxaci*, *C. cubicularis*, *Agrotis nigricans*, *A. tritici* (one),* and a number of others of less interest.

Throughout the season dusking was by far the best mode of collecting Lepidoptera; the rarest moth obtained in this district during the season was taken in this way by Mr. M. C. Dixon, who, on boxing a specimen of *Hydrilla palustris*,† thought it was only *Miana arcuosa*.

Dusking in April and May resulted in the capture of *Selenia bilunaria*, *Lobophora carpinata* (*lobulata*), *Anticlea badiata*, *A. derivata*, and *Cidaria suffumata*; and in June *Lithosia mesomella*, *Hepialus velleda*, *H. lupulinus*, *H. hectus*, *Cilix glaucata*, *Odontopera bidentata*, *Aspilates strigillaria*, *A. gilvaria*, *Lomaspilis marginata*, numerous *Eupitheciæ*, *Melanthia albicillata*, *Cidaria corylata*, and a host of others.

In July the lanes and meadows swarmed with Lepidoptera (chiefly Geometræ) at dusk, and among the species taken were *Leucania impura*, *L. pallens*, *Axylia putris*, *Miana bicoloria*, *Uropteryx sambucaria*, *Cidaria prunata*, *C. fulvata*, *C. pyraliata*, *C. dotata*, *Pelurga comitata*, and *Eubolia limitata*.

During August very much the same things were taken as in July, with a few exceptions and additions; among the latter were *Larentia olivata* and *Epione apiciaria*.

Later on, towards the end of the year, *Hybernia aurantiaria*, *H. defoliaria*, *Cheimatobia brumata*, and *C. boreata* were taken.

* *A. tritici*: this is only the second occurrence of this insect in Carlisle, and is rather a strange capture so far inland.—J. M.

† *Hydrilla palustris*: this is the fifth specimen taken in the Carlisle district; two were taken during the day, resting among the long grass; and three—including that now referred to—have been casually netted at dusk among other things. So far none have been taken at light.—J. M.

Day-work, like sugaring, was not what it should have been, owing to the stormy weather (most particularly on Saturdays, my half-holiday). But in spite of the weather I managed to net a few *Thecla rubi* between the showers in May; and in June and July I took *Argynnis selene*, *A. euphrosyne*, *Melitæ aurinia* (*artemis*), *Erebia epiphron* var. *cassiope*, *Cænonympha typhon* (*davus*), *Ino statice*, *Nemeophila plantaginis* (and var. *hospita*), *Emmelesia albulata*, *Eupithecia nanata*, *Melanippe hastata*, &c.

I did not get many day-flying Lepidoptera of any interest after July, except *Thecla quercus* and numerous micros.

I have found dull days to be the best for trunk-searching, and the year 1902 not having been a sunny one, this mode of collecting was more productive than in former years. In March *Anisopteryx ascularia*, and in April *Xylocampa areola* and *Lobophora lobulata* were taken. During May and June Lepidoptera were very numerous on tree-trunks. Among the more noteworthy were *Demas coryli*, *Tephrosia crepuscularia*, *T. biundularia*, *Bapta temerata*, and *Melanthia albicillata*. After June I did not find trunk-searching very productive, although I took *Amphidasys betularia*, *Thera firmata*, &c.

The sallows, which in 1902 were very fine, were not workable until the beginning of April, when they failed to attract *Panolis piniperda* in anything like the numbers taken in former years; and although *Tæniocampa gothica*, *T. stabilis*, and *T. cruda* were very plentiful, *Pachnobia rubricosa*, *Tæniocampa instabilis*, and *T. gracilis* were not so.

Throughout the season working suburban gas-lamps was very productive, especially in late summer and autumn.

During 1902 certain species were more plentiful than in 1901; among these are *Diloba cæruleocephala*, *Hydræcia micacea*, *Luperina testacea*, and *Plusia gamma*; while some species—*Charæas graminis* and *Noctua xanthographa* for example—have been very scarce, although last year they simply swarmed.

Throughout the year I obtained many species by working flowers at dusk and after. At patches of deadnettle (*Lamium*), just at dusk, I took *Habrostola tripartita*, *Plusia chrysitis*, *P. iota*, and *P. pulchrina*. I also found *Carduus*, *Senecio*, and *Scabiosa* very attractive to Lepidoptera, both during the day and at night. Honeysuckle I have found most attractive on nights when sugar has failed.

I paid special attention to larvæ, and by beating, sweeping, and searching for species in this stage I have reared a large number of Lepidoptera. From larvæ taken at night in the spring I bred, among many other species, *Noctua castanea*, *Triphæna ianthina*, *T. fimbria*, *Pseudoterpna cytisaria*; and *Melitæ aurinia*, *Nemeophila russula*, *N. plantaginis*, &c., were bred from larvæ taken during the day.

I did not do much pupæ-digging, as I gave all my spare moments to larvæ-beating, although I bred *Agriopis aprilina*, *Phigalia pendaria*, *Hybernia defoliaria*, &c., from pupæ dug at the foot of oaks. I also got other pupæ, which I am now wintering along with a few hundred pupæ from larvæ beaten, swept, &c., during summer and autumn.—JAS. A. MALCOLM; Carlisle, Jan. 1st, 1903.

LEPIDOPTERA IN SUFFOLK, 1902.—The year 1902 at the outset was

unseasonably mild; winter then came, and lingered in the lap of spring and summer in most provoking fashion, so that it was not till the end of May that I was tempted to set forth on a ramble after Lepidoptera.

True I had heard of such things as *Aleucis pictaria*, *Taniocampa rubricosa*, and *Anticlea badiata* having been taken at Ipswich street-lamps, but to toil all night and catch only one specimen is not the extent of my enthusiasm. I did visit the salallows once at Easter, but the wind came on to blow biting from the north-west, and having shaken a few of the commoner *Taniocampidæ* into the sheet, I trudged home disgusted, and chilled to the marrow. Not till April 8th did I start my diary with the records of *Hypena rostralis* (2), *Depressaria applana* (3), and *Alucita polydactyla*. These I discovered hybernating in Freston Tower, of Margaret Catchpole associations. On April 29th *Tinea fuscipunctella* came to light at a public dinner at the Conservative Club. Then an uneventful month passed by till May 28th, when I had the unexpected good fortune to obtain *Amphidasys betularia* (var. *doubledayaria*), *Acronycta rumicis*, and *Trachea piniperda* at light. All were in the pink of condition, a circumstance which bespeaks the lateness of the season. With *T. piniperda* I was especially pleased, as I had been searching for it for ten years in various parts of Suffolk without success, a fact which points to its rarity. I believe the record is the first made in Ipswich. The *doubledayaria* var. of *A. betularia* was a rich black specimen with scarcely a speck of white, and that where the wings overlap. I have taken this melanic form almost yearly, though my collecting has been unavoidably spasmodic, which prompts the conclusion that it is by no means uncommon. As Suffolk is practically an entirely agricultural county, the point may be interesting to those who have sought for a solution in the influence of smoke from manufacturing centres.

My first excursion to Belstead Wood, that favourite resort of collectors, was on June 21st. I spent an afternoon with the beating-stick, the result being the capture of *Ephyra punctaria* (common on trunks), *Macaria notata*, *Acidalia remutata* (several), *Panagra petraria* (several), *Venilia maculata* (2), *Asthena luteata*, *A. candida* (plentiful), *Eudorea ambigualis* (swarming on trunks), *Roxana arcuella*, *Crambus pascuellus*, *Halonota cirsiana* (in cop. on a thistle-head), *Herminia tarsipennalis*, *Harpella geoffrella*, *Adela degerella*, and *Glyphipteryx fusco-viridella* (these swarmed in sheltered patches). I found *Anthocharis cardamines* in the country lanes still in good condition; one was a female. *Argynnis euphrosyne* was just coming out. I revisited the wood on the evening of June 25th, expecting to do well at dusk, but it proved an utter failure. In the two hours beforehand, however, I was kept continually going, my captures, mostly fugitives from trunks, comprising:—*Limacodes testudo*, *Drepana falcula* (*falcataria*), *Hepialus sylvanus*, *Acidalia subsericeata*, *A. trigeminata* (a lovely dark-marked specimen), *Cidaria corylata*, *Corycia temerata*, *E. punctaria*, *Ebulea verbascalis*, *A. ramella*, *Gelechia fugitivella*, *G. terrella*, *G. proximella*, *Gracilaria sweederella*, *Lithocolletis quercifoliella* (several), *Tischera complanella*, *Ptycholoma lecheana* (2), and *Nepticula argentipedella*, and many others usually taken in May. *Sphinx ligustri* and *Smerinthus tiliæ* I also recorded in June.

An hour round the lamps on June 30th yielded good results. *Pyralis costalis* was in the pink of condition, and as numerous as last year. Other micros bottled were *Crambus cerusellus*, *Aspis udmanniana*, *Tortrix forsterana*, *Spilodes verticalis* (cinctalis), *Hydrocanpa stagnata*, *Xanthosetia hamana*.

Incidentally, I may say that it is my practice to immediately kill all micros taken at light, keeping a separate poison-bottle fitted with a lining of cotton-wool for this purpose. They can easily be dislodged afterwards, and I find it more expeditious than using pill-boxes, whilst if proper precautions are taken there need be no trouble about stiffening.

Reverting to the night in question, the Bombyces were only represented by *Dicranura bifida* and *Ptilodontis palpina*, and the Noctuæ by *Dianthæcia cucubali*, *Grammesia trilinea* (3), and some other commoner things. The Geometræ, however, were in evidence, and included *Eurymene dolabraria*, *Acidalia amataria*, *Eupithecia rectangularata*, *E. succenturiata*, *Phibalapteryx vitalbata*.

Old walls were not so productive as I usually find them, but in the same spot where I always can find *Pædisca bilunana* I boxed what proved to be my most interesting record of the year, inasmuch as its identity at the time of writing is a matter of question, I believe. It is at present in the collection of Mr. C. G. Barrett, F.E.S., to whom I presented it after he had kindly endeavoured to name it. The specimen is a very fine one, and has a characteristic look about it, whilst it is much smaller than *Gelechia fugitivella*. The fact, however, that it was taken near some elms, Mr. Barrett thinks, strongly points to its being a tiny variety of that species. At any rate it is the nearest to it of any species known to Mr. Barrett. I should have added that the curious capture was made on June 28th, at Ipswich, at the foot of Anglesea Road.

Among other interesting micros descried on wall or paling were two dark forms of *Pædisca oppressana*, and some extremely variable *Tortrix xylosteana* and *Batodes angustiorana*; also a large *Hyponomeuta padella*. Specimens of *Bucculatrix boyerella* and *Argyresthia retinella* were also discovered. *Tinea fuscipunctella*, *T. merdella*, *T. pellionella*, and *Gelechia affinis* were located in an attic.

Another visit on a fine day to Belstead Wood, on July 9th, was not at all unproductive. At the cottage in the lane I found the good lady had been keeping a very fine specimen of *Smerinthus ocellatus*, male, for the first comer. It was alive, but scarcely damaged. Search about the garden and outbuildings resulted in the finding of swarms of *Tinea ferruginella*, which were flying in groups like gnats. I boxed a very fine series, also a large and dark *T. pellionella*. Though there were numerous *Acidalia virgularia* on the sheds, I failed to find any more of the unique var. which I recorded the year before. The captures at the wood were not of great importance, but I was interested to net *Homæosoma sinuella* again. Other species met with were *Penthina cynosbatella*, *Sericoris lacunana* (3), *S. urticana*, *Ebulea verbasalis*, *Dicrorampha petiverella*, *Grapholitha trimaculana* (common), *Spilonota dealbana*, *Gelechia terrella*, *Ecophora lunaris*, *Æ. fuscescens*, *Argyresthia brochella* (4), *Coleophora limospennella*, *Cemiostoma laburnella*, a var. of *Tortrix unifasciana*, &c. Amongst other records for July were *Ecogenia quadripunctata*, *Tineola biselliella*, and *Tinea merdella*.

I spent the first week of August at Felixstowe, but did no active collecting, as I was a victim to cramp most of the time. I was lucky one night, however, to take *Spilodes palealis* off a lamp; also *Liparis chrysorrhæa*. *Zygæna filipendulæ* were found flying in the same spot on the common as the previous year, but nowhere else. *Gelechia desertella* was common, and I found one *G. populella* on palings. I left Suffolk to go on a holiday to Bath, but the only good things taken were *Bryophila glandifera* and *Æcophora unitella*.

The latter end of August I removed from Suffolk to Norwich, and the exigencies of work on a daily paper precluded any collecting. *Catocala nupta* seemed to be numerous on walls, and I also saw *Xanthia cerago* and *Polia flavicincta*. *Melanthia bicolorata* was taken off a naturalist's window. The usual winter Geometræ were observed on the street-lamps.—CLAUDE A. PYETT; 25, Grosvenor Road, Norwich.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—*March 4th, 1903.*—Professor E. B. Poulton, M.A., D.Sc., F.R.S. President, in the chair.—Mr. Harry Eltringham, of Eastgarth, Westoe, South Shields, was elected a Fellow of the Society.—Colonel Bingham sent for exhibition specimens of Diptera and two Aculeates from Sikhim, constituting in the banding of the wings and other characteristics a striking instance of mimicry. The Rev. F. D. Morice drew attention to the way in which the fly imitated with its tibia the tarsus of the bee.—Mr. A. J. Chitty exhibited specimens of *Atomaria rhenana*, Kr., taken by him out of some flood rubbish found near Lancing, probably the same locality where the beetle was discovered formerly by Dr. Sharp. He also exhibited a *Pinus*, apparently new to Britain, where it had probably been introduced, found in a granary in Holborn in 1893.—Mr. W. J. Kaye exhibited species of Lepidoptera from British Guiana, forming a Müllerian Association in which all but one were day-flying moths, the exception being an Erycinid butterfly, *Esthemopsis sericina*. The moths, belonging to three families, included Syntomidæ: *Agyrta micilia* and *Euagra celestina*; Hypsidæ: *Iostola divisa*; Geometridæ(?): *Pseudarbessa decorata*. It appears very evident from the specimens collected over eighteen months in exactly the same place, that the Syntomidæ in being so numerous have acted as the types, toward which the other species have converged. The particular interest of the exhibit consisted in the association being one of moths, a butterfly being the exception, and not one of butterflies with perhaps a single moth, which latter is so frequently the case in South America. The butterfly most closely resembled *Agyrta micilia*, one of the Syntomidæ that is perhaps the most abundant of all the groups.—Mr. C. O. Waterhouse read a paper entitled "Notes on the Nests of Bees of the Genus *Trigona*;" Mr. G. A. Rothney communicated a paper on "The Aculeate Hymenoptera of Barrackpore, Bengal," and "Descriptions of eighteen new species of Larridæ and Apidæ from Barrackpore, by Peter Cameron; and Colonel Charles Swinhoe communicated a paper "On the Aganiidæ in the British Museum, with descriptions of some new species."

March 18th.—The President in the chair.—Mr. H. W. Bell-Marley, Durban, Natal; Mr. J. C. Dollman, Newton Grove, Bedford Park, W.; Mr. W. W. Rowlands, Lickey Grange, near Bromsgrove; and Prof. J. H. Taylor, M.A., The Yorkshire College, Leeds, were elected Fellows of the Society.—The Rev. F. D. Morice exhibited, with drawings, a dissected gynandromorphous specimen of a bee (*Osmia fulviventris*, Panz.) sent to him (with the gynandromorphous *Eucera* exhibited at the last meeting, and several other similar monstrosities) by M. Jean Vachal, of Argentat, France. The species is a common one; whether that called *fulviventris* in the British list is a variety of it, or a distinct species, is not yet finally decided.—Mr. A. Bacot exhibited a number of specimens of *Malacosoma neustria* $\times$ *castrensis* in various stages, including a series of six male and sixteen female imagines reared during 1902 from one batch of ova laid by a female *castrensis*, which had been mated with a male *neustria*, and two females reared from another batch of ova the result of a similar cross; also blown larvæ of hybrid parentage, and twigs showing attempts at ovipositing on the part of female hybrids that had paired with hybrid males of the same brood; also a series of *M. neustria*, *M. castrensis*, and the hybrid moths reared during 1901 for comparison. The females attempted egg-laying, adopting the position and motions of normal females of *castrensis*, but at each opening of the ovipositor they produced only the small drop of cement which accompanies the egg in the normal oviposition of the parent species, resulting in a more or less perfect spiral band of cement upon the twigs. Perhaps the most interesting feature of the exhibit was the great variability shown by the specimens comprising the larger of the 1902 brood compared with the remarkable uniformity of the hybrid moths reared during the previous year.—Mr. H. St. J. Donisthorpe exhibited specimens of *Trimum brevicorne*, Reich., from Chiddingfold, Surrey, an unusually southern locality for this species.—Mr. C. P. Pickett, specimens of *Hybernia leucophaëria* and *Phigalia pedaria* taken at Chingford, and ova of *Endromis versicolora* on birch twigs, laid March 16th. The parent moths paired the day before at 1.20 p.m., and remained *in cop.* thirty-three and a-half hours. The female in the act of oviposition prefers to rest head downwards, and sometimes uses the back legs for arranging the ova.—Mr. G. C. Champion exhibited a long series of a series of *Cneorrhinus* (? *pyriformis*) from Piedrahita, Spain, and called attention to the great dissimilarity between the sexes, and also to the possibility of the females being dimorphic, one form clothed with green scales, and the other with grey scales like the male. He also exhibited *Dorcadion dejeani*, Chevr., from the Sierra de Bejar, a species peculiar to that district.—Mr. R. McLachlan, F.R.S., exhibited a dragonfly belonging to a small species of the genus *Orthetrum*, attacked by an Asilid fly almost as large as itself, taken in Persia in June, 1902, by Mr. H. F. Witherby. The fly had inserted its proboscis at the junction of the head and prothorax, a vulnerable point. He also exhibited a female specimen of a large *Æschnid* dragonfly, *Hemianax ephippiger*, Burm., captured in a street at Devonport, on Feb. 24th, 1903. The species has once been observed on the Continent as far north as Brussels.—Professor E. B. Poulton, F.R.S., exhibited seasonal forms of *Precis antilope*, parent and offspring, bred in 1902 by Mr. G. A. K. Marshall in South Africa, showing the remarkable dimorphism

of the species, which was especially noticeable in the protective colouring of the under side of the dry-season form as compared with the startling conspicuousness of the wet. He also exhibited *Precis caelestina*, captured by Dr. C. A. Wiggins in the Victoria Nyanza region, with the dry-season form of that species, now taken probably for the first time. The resemblance of the under side of the latter to dead leaves was very marked. Prof. Poulton also showed lantern-slides of the same two species.—Mr. W. J. Lucas exhibited with the lantern a slide showing the larva of *Cossus ligniperda* in its gallery in a tree-trunk.—Dr. T. A. Chapman exhibited with the lantern a series of slides illustrating the life-history of *Liphyra brassolis*, as described in the 'Entomologist,' vol. xxxv., pp. 153, 184.—Mr. G. C. Champion, F.Z.S., read a paper on "An Entomological Excursion to Bejar, Central Spain."—Mr. Edward Saunders, F.R.S., F.L.S., communicated a paper on "Hymenoptera Aculeata collected by the Rev. A. E. Eaton, M.A., in Madeira and Teneriffe, in the spring of 1902."—Dr. Frederick A. Dixey, M.A., M.D., read a paper, illustrated by lantern-slides, "On Lepidoptera from the White Nile, collected by Mr. W. L. S. Loat, F.Z.S.; with further Notes on Seasonal Dimorphism in Butterflies." He said that Mr. Loat's series did not seem to favour the opinion that had been held that *Teracolus evagore* as described and figured by Klug was the dry-season form of *T. yerburii*, Swinh. It appeared from this and other evidence that Mr. G. A. K. Marshall was right in dissociating the two forms.

April 1st.—The President in the chair.—Mr. M. Jacoby exhibited specimens of *Rhagiosoma madagascariensis*, Heyd., from Madagascar, and *Carpophagus banksia*, McLeay, and *Mecynodera coxalgica*, Boisd., from Australia. In appearance they presented many characteristics not usually associated with phytophagous Coleoptera.—Mr. C. P. Pickett exhibited forced specimens of *Dilina tiliæ* bred from Essex pupæ this year. In two females the usual rust-coloured markings on the fore wings were abnormally pale, and the hind wings were black. In another female the rust-red hue pervaded the whole wing area, the four normal green blotches being a deep reddish brown, corresponding with a form of *Smerinthus populi* frequently bred. A third female displayed light-brown hind wings; while one male was of the normal female colouration.—Mr. W. J. Lucas exhibited lantern-slides of the specimen of *Hemianax ephippiger*, and of the *Orthetrum* species attacked by an Asilid fly, shown by Mr. R. McLachlan at the last meeting.—Dr. T. A. Chapman read a paper entitled "Contributions to the Life-history of *Orina* (*Chrysochloa*) *tristis* var. *smaragdina*."—Sir George Hampson read a paper on "*Apoprogones hesperistis*, a remarkable new lepidopterous insect from Zululand." He said that the genus must be referred to the family *Euschemonidæ*, which is represented by the single species *Euschemon rafflesia*, Westw. In what quarter of the globe the family originated it was impossible to say, but the appearance of the species in question suggested that it was a survival of the scattered remnant of the Antarctic fauna. It was, however, most remarkable that the genus should occur in Africa and Australia alone.—Mr. F. Enock read a paper, illustrated with lantern-slides, on "The Life-history of *Cicindela campestris*." A discussion followed as to how far the abundance of food in the larval state affects the development

of insects, in which Mr. W. E. Sharp, the President, and other Fellows took part. Mr. Enock said that where the food supply happened to be insufficient, neuropterous nymphs would continue two years in that stage, and Mr. C. O. Waterhouse mentioned a case reported to him of the larvæ of *Vanessa urticae* which, having exhausted their summer pabulum, retired to hibernate until the following year. Mr. A. J. Chitty said he had observed that coleopterous larvæ under similar circumstances would consume flies; while Mr. H. St. J. Donisthorpe said that he had bred successfully a phytophagous species of the same order by feeding them on paper.—H. ROWLAND-BROWN, *Hon. Sec.*

SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—*Feb. 26th.*—Mr. Step, F.L.S., President, in the chair.—Mr. F. G. Cannon, of Hampstead, was elected a member.—A special donation to the library was announced, consisting of a complete set of the papers and articles written by Prof. E. B. Poulton, F.R.S., on protective resemblance in insects, from the author.—Mr. Turner exhibited a number of species of Lepidoptera, Coleoptera, Hemiptera, and Diptera taken during a week spent at Inistioge, Co. Kilkenny, Ireland, in company with Mr. Step. Most of the species were common, but interesting as being records from a hitherto unworked district. *Soronia punctatissima*, a coleopteron found in some numbers in a *Cossus*-infected poplar tree, was worth noting as a new record for Ireland.—Mr. G. W. Browne, a number of Lepidoptera from Deal, taken in August, 1902, and including long and varied series of *Agrotis tritici* and *A. valligera*, together with *Syrichthus malva* v. *taras* from Hailsham, *Apamea ophiogramma* from Lee, *Dicycla oo* from Lee, and *Iodis vernaria* from Lee.—Mr. Goulton exhibited some very fine photographic slides of the ova and larvæ of several species of Lepidoptera.

March 12th.—Mr. E. Step, F.L.S., President, in the chair. Mr. Hickman, of Kennington Road, and Mr. Furnival, of Harlesden, were elected members.—Dr. Chapman exhibited living examples of the three European species of the genus *Thais*: viz. *T. rumina*, *T. polyxena*, and *T. cerisyi*. He also showed a bird parasite, *Docophorus communis*?, taken from a blackbird, and called attention to the curious jointed appendage in front of the antenna, which form a guard to the latter organ, and is said to occur in no other group of insects.—Mr. R. Adkin, series of *Acidalia aversata*, consisting of broods from a non-banded female and from a banded female. In both cases, banded and non-banded, offspring were produced. He also read notes as to the colour-variation of the two series.—Mr. W. J. Kaye, specimens of *Larentia didymata*, bred off broom from Co. Kerry. They had a very reduced central black band, and all the markings were very clearly contrasted with the very pale ground colour.—Professor E. B. Poulton, F.R.S., gave an address on "Recent Researches in Protective Resemblance, Warning Colours, and Mimicry in Insects," and illustrated his remarks with a very large number of lantern-slides.

March 26th.—The President in the chair. Mr. E. Warne, St. John's Hill, Clapham, was elected a member.—Mr. Jennings exhibited a series of the very local *Cryptocephalus bipunctatus* (var. *lineola*, F.) taken at Charing, Kent, on hazel bushes.—Mr. Colthrup, hibernating larval nests of *Porthesia chrysorrhæa* from Newhaven, where they could

be found abundantly.—Mr. W. J. Kaye, the two Ithomiines, *Methona confusa* and *Thyridia psidii*, from British Guiana, and remarked on the wonderful agreement in colour between these two distinct species, both there and in Paraguay.—Mr. Adkin, a very dark example of *Amorpha* (*Smerinthus*) *populi* bred from a larva taken at Bexley. It was considerably darker than a Sutherland example in both the olive-grey of the fore wings and the red patch of the hind wings.—Dr. Chapman, specimens of *Lasioptera rubi*, a Cecidomyid that makes swellings in the stems of bramble.—Mr. Hy. J. Turner, a large number of species of various orders of insects, collected at Amersham, Bucks, during a week's holiday spent there at the end of June, 1902, and gave notes on the fauna and flora of the district.—HY. J. TURNER (*Hon. Rep. Sec.*).

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.—The Annual Meeting of the above Society was held in the Royal Institution on Monday, January 19th, when, in the unavoidable absence of the President, Mr. S. J. Capper, F.E.S., Dr. J. W. Ellis presided over a large attendance of members. Mr. J. Hidson Taylor, of Buxton, was unanimously elected a member of the Society.—The following officers were elected to serve during 1903:—President, Mr. S. J. Capper, F.E.S.; Vice-Presidents, Messrs. W. Webster, F.R.S.A.I., R. Tait, Jun., and F. C. Thompson; Hon. Treasurer, Dr. J. Cotton, F.E.S.; Hon. Secretaries, Messrs. E. J. B. Sopp, F.R.Met.S., F. Birch, and H. Tonkin; Hon. Librarian, Mr. R. Wilding; Council, Dr. G. W. Chaster, Messrs. J. R. le B. Tomlin, F.E.S., F. N. Pierce, F.E.S., John Lea, W. A. Tyerman, W. D. Harrison, and A. Tippins.—Mr. R. Newstead read a paper on the life-history of the following species of Coccidæ: *Eviopeltis festuæ*, *Lichtensia viburni*, *Vinsonia stellifera*, *Pseudococcus ulicis*; and also some important observations on the male of *Lecanium hesperidum*, which he has discovered undergoes a complete metamorphosis, as in the males of other species of the Coccidæ. Mr. Newstead also dealt with the formation of the curious test of waxy covering in *Ceroplastes*, and some important observations on the secretion of honeydew in *Palvinaria vitis* var. *ribesiæ*, a full account of which will appear in the second volume of his work on the Coccidæ of the British Isles, shortly to be published by the Ray Society.—The following exhibits were examined:—A pair of *Chrysophanus dispar* from Yaxley (1848), forming a portion of probably the last catch of the large copper in Britain, and a beautiful series of *Lycæna arion* from S. Devon, taken in 1902 by Mr. J. R. Charnley, who also exhibited, on behalf of Mr. T. Dewhurst, most excellent slides of *Cerura vinula* and *Pieris rapæ*; the genus *Oporabia*, showing hybrid forms between *O. filigrammaria* and *O. autumnaria*, by Mr. Pierce; nymphs and imagines of the exotic earwig, *Chelioches morio*, from Sandakan and the Dammar Islands, by Mr. Sopp; *Lycæna acis*, by Mr. Collins; series of *Erebia blandina*, &c., by Mr. Prince; and an almost black *Abraxas grossulariata*, by Mr. A. Tippins.

The second ordinary meeting was held in the Royal Institution, Liverpool, on Monday, the President, Mr. S. J. Capper, presiding over a large attendance of members. The minutes having been confirmed, the Secretary announced donations to the library from Dr. J. Harold Bailey (Port Erin), and Mr. H. St. John K. Donisthorpe, F.Z.S.

(London). Mr. A. H. Lister, of Bootle, was unanimously elected a member of the Society, after which, on the motion of Dr. Cotton (St. Helen's), seconded by Mr. J. R. le B. Tomlin (Chester), it was decided to hold a summer gathering in Delamere Forest on June 13th. The paper of the evening was contributed by Dr. Edmund Capper, of Leicester, son of the veteran President, who dealt in a most interesting manner with "the story of *Acidalia contiguaria*," of which desirable lepidopteron he had probably captured more specimens, in its natural habitat on and in the neighbourhood of Moel Llys, than any other entomologist. Dr. Capper's paper, which traced the first occurrence of *A. contiguaria* to the late Mr. Richard Weaver in 1855 to its distribution at the present day, also dealt with many important facts in the life-history of the species. The paper was discussed by Mr. S. J. Capper, Dr. J. Ellis, and Messrs. Pierce and Tait, the latter of whom confirmed the lecturer's premise that only one brood was produced during the year. A hearty vote of thanks having been accorded Dr. Capper, the following exhibits were made:—*Noctua flammatrix*, *Xylina conformis*, *Leucania extranea*, and other rare British Noctuidæ, by Mr. F. N. Pierce (Liverpool); long series of the light and dark forms of *A. contiguaria* from Penmaenmawr, by Mr. R. Tait, junr. (Manchester); *Thanasimus formicarius*, new to the local list, by Mr. Guy Dunlop (Mossley Hill); embryo nest of *Vespa germanica* from beehive, by Mr. F. Birch (Liverpool); a fine series of *Odontopera bidentata*, varying from black to very pale brown, and including one semi-diaphanous specimen, by Mr. B. H. Crabtree (Manchester), and a fine example of *Ædipoda cærulescens*, of which two specimens have been taken at Southampton, by Mr. E. J. B. Sopp (Birkdale), Hon. Secretary.

BIRMINGHAM ENTOMOLOGICAL SOCIETY. — *February 16th, 1903. — Annual Meeting.*—Mr. G. T. Bethune-Baker, Vice-President, in the chair. The annual reports of Council and of the Treasurer, &c., were received. The following were elected to be Officers and Council for the ensuing year:—President, Mr. G. T. Bethune-Baker; Vice-President, Mr. R. C. Bradley; Treasurer, Mr. R. C. Bradley; Librarian, Mr. A. H. Martineau; Hon. Secretary, Mr. Colbran J. Wainwright; Members of Council, Messrs. H. Willoughby Ellis, J. T. Fountain, A. D. Imms, and G. W. Wynn. The following were exhibited:—By Mr. G. T. Bethune-Baker, the remarkable Lycænid *Liphyra brassolis*, Hew., in various stages; larvæ in spirit, pupæ and imagines. He gave an account of its remarkable life-history as far as it has been discovered by Mr. Dod. He also showed imagines of three species of *Ogyris*, which are also ant-feeding Lycænids, but about which less is known at present.—Mr. H. Willoughby Ellis, two drawers of Carabidæ, including the Anisodactylina, Pterostichina, and Harpalina, which were shown partly to illustrate his new method of carding every specimen separately for greater convenience in examination.—Mr. A. H. Martineau, pupæ of a wasp from Mexico with a big fungus—*Cordiceps* sp.?—growing out of the thorax. It grows out between the prothorax and mesothorax, splitting the latter. It was remarked as curious that the insect should have successfully reached the pupal stage in each case.—COLBRAN J. WAINWRIGHT, Hon. Sec.

RECENT LITERATURE.

Economic Reports:—(1) C. P. LOUNSBURY, 1902, "Rep. Govt. Entom. for 1901," Cape of Good Hope, pp. 1-103; 6 plates. (2) CLAUDE FULLER, 1902, "2nd Rep. Govt. Entom. (for 1901)," Natal, pp. 1-72; 2 plates and 26 text figs. (3) J. B. SMITH, 1902, "Rep. Entom. Dept. New Jersey Agric. Coll. Experiment Sta. for 1901," pp. i-viii, and 463-587; 36 figs. (of which 15 are full-page). (4) CECIL WARBURTON, "Orchard and Bushfruit Pests, and how to Combat them," 1902 (Publ. R. Agric. Soc. England), pp. 1-20; 12 original text figs.

THESE Reports are all of the general character of those issued from time to time by their respective Governments. Beyond a brief note relating the introduction of natural checks for insect pests, the greater part of the Cape Entomologists' Report deals with Tick-Heartwater investigations, "Heartwater" being a disease, often fatal, of goats and sheep, supposed to be transmitted by a species of tick (*Amblyomma hebraeum*). The Natal second Report forms a supplement to the first, with general remarks upon the year's work. We regret to learn that Mr. Fuller's engagement was originally for three years only, and that this may be his last Report. We trust that this may not be the case, but that more enlightened counsel may direct the Natal Government's policy. Mr. Fuller has our sympathy in the apathy of the Natal farmers and fruitgrowers. He made arrangements to deliver three lectures on insect pests, but the first two fell through from "want of time" at the meetings; at the third, which was specially arranged, two individuals turned up, "the President of the Association and myself." The people of the district certainly deserve the worst that may happen to them.

Dr. Smith's Reports are so well known that a lengthy notice is unnecessary. The major part of the present bulletin deals at length with the "Mosquito and Malaria" question. An account is also given of the attempts—largely successful—to naturalize the accidentally introduced Chinese Mantid—*Tenodera sinensis*. It is hoped that these predaceous, ever-hungry Orthoptera, which have actually reproduced in New Jersey while at large, will prove valuable allies against some of the worst insect pests of the State.

The Agricultural Society's Report is of a popular nature, no scientific names being employed, and deals with various orchard pests. It will doubtless be useful to fruit-growers.—G. W. K.

T. D. A. COCKERELL. "The Classification of the Aleyrodidæ" (July 31, 1902), Proc. Acad. Nat. Sci. Philadelphia. Pp. 279-283. Plate xv.

Two genera of this rhynchotal family are acknowledged—*Aleurodicus* with thirteen species, all inhabiting the warmer parts of America (except one form from the Viti Isles, which Cockerell suspects was introduced upon *Psidium* from America); a new subgenus, *Dialeurodicus*, is formed for the thirteenth species. The second genus, *Aleyrodes*, is cosmopolitan; ninety-seven species are enumerated, distributed among five subgenera (three new). It would perhaps have been an improvement had full references been given; the list of species, however, is very useful, and forms a companion to the author's well-known Check-list of Coccidæ and first supplement thereto.—G. W. K.

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AN ABERRATION OF *MELITÆA DIDYMA*.

By H. ROWLAND-BROWN, M.A., F.E.S.



THIS pretty aberration of *Melitæa didyma* (male) was taken by me in the valley of the Tarn, near Château de la Caze, Cevennes, on July 23rd, 1901. The under side is remarkable for the almost perfect obliteration of the outer fulvous band on the lower wings, and the disappearance of the usual arrangement of black spots between it and the basal band, which, again, has absorbed the inner white area, and covers practically the basal

area to the costa. There is a similar poverty of spots on the upper wings, and the upper surface is also almost devoid of markings. The lower figure represents a normal male specimen for comparison. I may add that all through the very interesting mountain region of South-central France the orange-red and orange-brown coloration, both in *Melitæa* and in *Argynnis*, tends to a clear cold clay-yellow-brown, especially in *A. niobe*, of which species the ab. *eris*, as elsewhere in the more elevated regions of France and Switzerland, appears to predominate. Specimens of *didyma* from Cortina-di-Ampezzo exhibit a similar tendency; the fiery foxy brown of the wing pigment being in my series much subdued and deadened. Both in the male and female, but especially in the latter, the aberrant tendency is most marked, whether on the upper or under side, while I have seen specimens of *Melitæa cinxia*, notably some exhibited by Mr. H. Goss at the Entomological Society last year, nearly approaching the extreme form of *didyma* which I have figured.

TWO NEW AUSTRALIAN CULICIDS.

BY FRED. V. THEOBALD, M.A.

THE following are descriptions of two new Culicids recently sent me by Dr. Bancroft from Queensland. There is at present a plague of mosquitoes in Queensland and other parts of Australia, the two commonest species being *Culex annulirostris*, Skuse, and *C. marinus*, Theobald.

Genus MACLEAYA, nov. gen.

Intermediate between *Stegomyia* and *Culex*.

Head covered with flat scales over most of its surface, but with a median line of narrow-curved scales. Palpi short in the female, three-jointed, with two basal constrictions; apical joint minute, penultimate joint large, swollen apically and truncated; the ante-penultimate broad apically, becoming narrower and swollen again basally, two basal constrictions looking almost like joints. The apex of the penultimate joint is studded with round spots. Palpi long in the male, longer than the proboscis, the two apical joints short, rather swollen, also the apex of the ante-penultimate; hair-tufts rudimentary. Thorax with narrow-curved scales; scutellum with small flat scales on the median lobe, narrow-curved ones on the lateral lobes.

This genus differs from *Stegomyia*, to which it bears a strong superficial resemblance, in having narrow-curved scales on the centre of the head and on the lateral lobes of the scutellum.

A single species only is known.

Macleaya tremula, n. sp.

Head silvery grey, with two large prominent black patches; proboscis black, unbanded. Thorax deep brown, with indistinct dull golden lines, the lateral ones over and in front of the roots of the wings curved, and white-scaled prothoracic lobes; pleuræ testaceous brown, with small white scales; scutellum brown, with white and black scales to the median lobe, white to lateral lobes. Abdomen black, the segments with median, basal, and lateral basal spots, the median creamy, the lateral white; venter with basal creamy bands. Legs black, the fore and the mid with narrow white basal bands to the metatarsi and front tarsals; the hind legs with a broad white basal band to metatarsi and first and second tarsals, third tarsal all black, fourth all white. Wings transparent.

♀. Head black, with flat black scales forming a large patch on each side, then a small grey patch, another small black one, and then more grey scales outside; the middle of the head with silvery-white narrow-curved scales, and a silvery-white line around the eyes; numerous small black upright forked scales over the occiput; palpi black with grey tips; clypeus and proboscis black; antennæ black, the base of the second joint bright testaceous, the second joint with small grey scales. Thorax deep brown, covered with very small narrow-curved bronzy-brown scales, with more or less pronounced irregular lines of pale golden scales; the line over and in front of the root of each wing curved; the golden scales are broader than the dark ones; on each side in front is a short line of white scales, and the prothoracic lobes are covered with similar coloured scales; in front of the scutellum are irregular (often indistinct) short lines of larger pale creamy scales, and some long backwardly projecting black ones; scutellum testaceous brown, the mid lobe with small flat grey scales in the middle, black ones at the sides, the lateral lobes with narrow-curved whitish ones; border-bristles large and black, there are also very large black ones on the mesonotum; metanotum black; pleuræ brown, with patches of flat grey scales. Abdomen black, the segments with basal median creamy spots, and basal lateral silvery white ones; the last segment (sometimes the last two) without the median spot; first segment testaceous, with black scales; border-bristles jet-black; venter white at the base, some of the segments with basal white areas, the apical segments black; genitalia white-scaled. Legs black, banded; coxæ pale, with patches of white scales, very long; femora black above, white ventrally; knee spot white; tibiæ black; in the fore and mid legs the metatarsi and first tarsal joints have narrow white basal bands, last three tarsi black; in the hind legs the metatarsi, first and second tarsal segments have broad snowy-white basal bands, the third tarsal is all black, and the fourth all white; ungues of all three pairs of legs equal and simple. Wings with brown scales, the lateral scales long and thin; the first submarginal cell longer and narrower than the second posterior cell, its base nearer the base of the wing, its stem less than half the length of the cell, stem of the second posterior cell as long as the cell; posterior cross-vein longer than the mid, about one and half times its own length distant from it; first longitudinal

and the subcostal densely scaled with large dark brown spathulate scales; fringe brown; base of the wing pale; halteres pale ochraceous. Length, 4.5 mm.

♂. Palpi black-scaled, apical joint white, base of penultimate joint white, also apex of the ante-penultimate, a small pale band about the middle of the long ante-penultimate joint, a few prominent black bristles on the last two joints, not forming regular hair-tufts, a distinct black spine at the apex of the ante-penultimate joint; the apical joint about half the length of the penultimate; plume-hairs of antennæ deep brown. Thorax as in the female. Abdomen narrow, brown, with either basal lateral white spots or basal white bands, which spread out laterally; hairy. Basal lobes of the genitalia broad and truncated. Legs ornamented as in the female; fore and mid unguis unequal, the larger uniserrated; hind equal and simple. Length, 4.5 mm.

Hab. South Queensland.

Time of capture. February.

Observations.—Described from a series of dried and spirit specimens collected and bred by Dr. Bancroft. This species was taken breeding in a fresh-water well near Dr. Bancroft's house. It does not appear to bite the human subject. Dr. Bancroft bred them out from larvæ in conjunction with those of *S. notoscripta* and *C. fatigans*. It is a very marked species, easily told by the leg-banding, thoracic and abdominal ornamentation. The thorax is subject to some variation, owing partly to denudation of the golden scales. The abdomen in the male is also variable, the lateral spots often merging and forming complete basal white bands.

Genus *STEGOMYIA*, Theobald (Mono-Culicid. i. p. 283, 1901).

Stegomyia punctolateralis, n. sp.

Thorax black, with dense bronzy-brown scales, unadorned except for pale scaled lines laterally; pleuræ snowy white, the white extending on to the mesonotum as a broad white line in front of the roots of the wings, and a narrower one just over the roots of the wings; prothoracic lobes white, *separated by a black curved line from the mesonotum*. Proboscis black, unbanded. Abdomen black, with apical white lateral spots; venter mostly white. Legs black, unbanded; coxæ and venter of femora, tibiæ, and to some extent the venter of the metatarsi of hind legs, white.

♀. Head covered with flat bronzy-brown scales, and a pale almost white border round the eyes. Palpi, proboscis, clypeus, and antennæ deep black. Palpi slightly clavate, much contracted at the base, apical joint minute. Thorax black, with bronzy-brown narrow-curved scales, paler almost grey ones behind and at the sides forming lateral pale lines, and a narrower one just over the roots of the wings; prothoracic lobes white scaled, separated from the rest of the thorax by a prominent black line; pleuræ densely white scaled; scutellum with small flat grey scales and brown border-bristles, four to the mid

lobe; metanotum deep brown. Abdomen deep brown with violet reflections, in some lights under the microscope bright violet, each segment with prominent apical later 'creamy spots, which in some segments spread almost across the apical borders so as to form prominent apical pale lines, but they never quite meet, except in the penultimate segment; the first segment testaceous, with large dense black scales in two confluent spots, with brown bristles; border-bristles very short, pale brown, shining apically. Venter creamy white; the apical spots are very pronounced on the ventral surface of dried specimens. Legs jet-black; venter of femora, of tibiæ and hind metatarsi silvery white; unguis small, equal, and simple. Wings with brown scales; fork-cells of moderate length, the first submarginal considerably longer and narrower than the second posterior cell, its base nearer the base of the wing; stem of the first submarginal cell more than half its length; stem of the second posterior nearly as long as the cell; posterior cross-vein about twice its own length distant from the mid cross-vein. Halteres with dull testaceous stem and fuscous knob. Length, 4.5 mm.

♂. Thorax and abdomen as in the female, but the abdomen narrower, and the apical lateral spots not quite so prominent. Basal lobes of genitalia densely bristly, bristles large and arise from distinct papillæ; claspers long and thin, simple. Antennæ deep brown, with deep brown plume-hairs, pale banding more or less noticeable; proboscis black; palpi shorter than the proboscis, deep blackish brown, no "hair-tufts," the last two joints of nearly equal length, the apical one slightly shorter, and with terminal bristles. Legs as in the female; fore unguis unequal, the larger uniserrated, the smaller simple; mid unguis unequal, both simple; hind legs very small, equal, and simple, much curved. Wings with brown scales; the first submarginal cell longer and narrower than the second posterior cell, the base nearly level with that of the second posterior; stem of the first submarginal about one-third of the length of the cell; stem of the second posterior cell about two-thirds of the length of the cell; posterior cross-vein considerably longer than the mid, and more than twice its length distant from it. Length, 5.5 mm.

Hab. South Queensland.

Time of capture. January.

Observations.—Described from a series of dried and spirit specimens collected and bred by Dr. Bancroft. It is a very marked species, one striking characteristic being the black curved line behind the white-scaled prothoracic lobes. The white lateral apical spots are also characteristic. Dr. Bancroft kept this species alive for a month in confinement, and during that time they bit on three occasions.

ON THE PARASITIC HYMENOPTERA AND TENTHREDINIDÆ COLLECTED BY MR. EDWARD WHYMPER ON THE "GREAT ANDES OF THE EQUATOR."

BY P. CAMERON.

(Concluded from p. 123.)

PIMPLINÆ.

DELEBŒA, gen. nov.

Fore wings without an areolet; the transverse basal nervure roundly curved; the transverse median nervure received beyond it. Stigma large. Antennæ long and filiform. Median segment with only one transverse keel, placed on top of apical slope. Abdomen smooth; the petiole broad at the base, becoming gradually wider towards the apex; the ovipositor as long as the abdomen. Clypeus clearly separated behind; its apex broadly rounded. Mandibles stout, bidentate. Temples moderately broad; the malar space moderately large. Legs slender; the claws not combed. Parapsidal furrows indicated at the base.

The eyes are bare and larger than usual; the occiput is not margined; the scutellum is not much raised above the level of the mesonotum; the median segment is widely obliquely depressed at the base; its spiracles minute, oval; the abdominal petiole is aciculated; the other segments are smooth and shining, and without any depressions; the hypopygium is moderately large.

Belongs to the *Lissonotini*. It can only be confounded with *Lampronota* and *Asphragis*; the former may be known from it by having two longitudinal keels on the median segment; the latter by its pectinated claws.

DELEBŒA ALBOMACULATA*, sp. nov.

Black; the abdomen from the petiole rufous, the segments at their apices narrowly lined with yellow; the edge of the pronotum, a line on the lower edge of the propleuræ on the apical half, a broader line on the apical two-thirds of the mesopleuræ on the lower side and the tegulæ, clear white; legs dark testaceous; the coxæ and trochanters clear white; the hinder coxæ broadly marked with black beneath; the wings hyaline, the stigma dark testaceous, the nervures black. ♀. Length, 6-7 mm.; terebra, 4 mm.

Hab. Corazon, 12,000 ft.

Antennæ black, thickly covered with a microscopic pile; there is a white mark on the apex of the scape below. Head black, and covered with a white pile; the inner eye orbits narrowly, the malar space broadly, the mandibles, except the teeth, the clypeus, except for an oblique black mark on the sides, a line on the sides of the lower part of the face, projecting on the inner side downwards and more narrowly upwards, and the palpi white. Pro- and mesothorax smooth and shining; the mesopleuræ minutely punctured. Metanotum opaque, shagreened, the middle closely and finely transversely striated; the apex below the transverse keel is finely, irregularly longitudinally

striated. The anterior femora are, for the most part, white below; the middle pair are darker coloured than they; the posterior tibiæ and tarsi are dark fuscous. The petiole is black, closely, minutely punctured, as are also the second to fourth segments; the second has a black mark on either side at the base, and two in the centre behind the middle; the ventral surface is white.

DELEBŒA FUSCIPES, sp. nov.

Black, a line on the pronotum, a narrower line on the lower edge of the propleuræ, the inner orbits, the sides of the face broadly, the mandibles except the teeth, and the palpi, white; the five apical segments of the abdomen brown, their apices narrowly yellow; the ventral surface for the greater part black; wings hyaline, the stigma and nervures dark fuscous. ♀. Length, 6 mm.; terebra, 4-5 mm.

Hab. Corredor, Machai, Sara-urcu, 12,700 ft.

Scape of antennæ white beneath. The front, vertex, and mesonotum are closely, finely, and distinctly punctured; the median segment is more strongly punctured; on the metanotum the punctures run into striations; the pro- and mesopleuræ are not quite so strongly punctured as it. The white lines on the pronotum project backwards on the inner side; the basal two segments of the abdomen are closely and minutely punctured; the ventral surface is for the greater part white.

CNEMOPIMPLA, gen. nov.

Antennæ stout, thickened towards the apex; the last joint of the antennæ large, if anything longer than the preceding two joints united; the flagellum thickly covered with short pubescence. Face full; its apex obliquely depressed; the clypeus convex, distinctly separated from it; it is rounded behind; obliquely narrowed towards the apex; the middle of the apex is obliquely depressed and clearly separated. Areolet large, wide; the transverse cubital nervures being widely separated above; the transverse basal nervure is interstitial; the transverse median nervure in the hind wings is broken almost in the middle. Median segment short, smooth, not areolated. The basal five segments of the abdomen are distinctly punctured, and have wide and moderately deep transverse depressions. Legs short and stout; the fore tarsi are not much longer than the tibiæ; the last joint of the tarsi fully two times the length of the preceding.

The fore femora are shorter and thicker than the others; the eyes converge above, and are sinuate on the inner side; the temples are moderately large; the malar space is also moderately large. The form of the mandibles I am unable satisfactorily to describe; they become gradually narrowed to the apex, which is curved inwardly, and ends, apparently, in two short teeth. The abdominal segments are wider than long; the ovipositor is long, but shorter than the body.

The characteristics of this genus are the stout antennæ with their elongated apical joint; the wide areolet and the convex clypeus separated from the face by a deep furrow.

CNEMOPIMPLA PILOSA, sp. nov.

Black; the fore femora and tibiæ bright red; the head thickly covered with longish, the thorax with shorter, fuscous pubescence; wings clear hyaline, the stigma and nervures deep black. ♀. Length, 8; terebra, 5 mm.

Hab. Machachi, 9–10,000 ft.

Front and vertex shining, smooth; there is a deep curved furrow in front of the anterior ocellus; they are covered with long black hair. The face is more thickly covered with longer black hair, and is punctured. The mandibles are shagreened and sparsely punctured at the base. Palpi black and thickly covered with white hair. Mesonotum shining and thickly covered with blackish hair. The scutellum is more sparsely haired, smooth, and shining, as is also the post-scutellum, which has its basal depression bordered by a keel at the sides, and there are two indistinct ones in the middle. The basal five segments of the abdomen are closely and strongly punctured; the ventral four basal segments are for the greater part white; the apical four segments are narrowly edged with white.

PANISCINI.

PARABATES WHYMPERI, sp. nov.

Dark luteous, the eye orbits yellow; the palpi pale testaceous; the apex of the mandibles black; the wings clear hyaline and highly iridescent; the stigma pale testaceous, the nervures darker. ♀.

Hab. Tortosillas, Chimborazo, 13,300 ft.

Face closely punctured, less closely in the middle on the apical half, the apex in the middle impunctate; the clypeus is more sparsely punctured; its apex impunctate. Ocellar region blackish; the front over each antenna fuscous, and with some obscure curved keels. Face and clypeus thickly covered with pale hair; on the clypeus the hair is much longer. Mesonotum closely punctured. Scutellum closely and distinctly punctured, its sides distinctly keeled; the apex less distinctly keeled in the middle. The post-scutellar region thickly covered with longish pale woolly hair. Median segment closely transversely punctured. Pleuræ closely and uniformly punctured. Legs coloured like the body; the tibiæ and tarsi thickly covered with white pubescence.

CHRYSIDIDÆ.

ELAMPUS ANDINUS, sp. nov.

Green, largely marked with purple; the flagellum of the antennæ black; the wings hyaline, their nervures fuscous. ♀. Length, 4 mm.

Hab. Machachi, 9–10,000 ft.

Scape of antennæ purple, the flagellum black, almost bare. Head purple, the vertex behind with rosy tints, in front blue and green, this being also the case with the front, which has a broad shallow furrow in the middle. The vertex, except behind the ocelli, and the front are strongly and closely punctured; the hinder part of the vertex and the outer orbits are sparsely and finely punctured. The pro- and

mesonotum are smooth and shining, and are sparsely punctured; the mesonotum has a few large punctures on the lateral lobes. Scutellum with four rows of large round punctures on the sides, the apex bearing similar punctures; the centre is smooth, the smooth part becoming narrowed towards the apex. Median segment raised in the centre, where it is closely irregularly reticulated; this part is bounded laterally by a large basal and a smaller middle area, broader than long, and by a larger apical one with a round fovea in the centre. Propleuræ strongly and deeply punctured; the mesopleuræ coarsely reticulated, the reticulations being in oblique rows. Legs for the greater part blue, the tarsi blackish; the tibiæ and tarsi covered with a pale down. Abdomen minutely and closely punctured; the apical incision is larger than usual; broader, more rounded, at the base; in length it is almost as long as its width at the apex.

TENTHREDINIDÆ.

SELANDRIA ANDEANA, sp. nov.

Black; the greater part of the prothorax, the four basal segments of the abdomen, the apex of the femora narrowly, and the base of the tibiæ more broadly, pale luteous; the wings hyaline, with a distinct fuscous tinge, the nervures and stigma black. ♀. Length, 8-9 mm.

Hab. Machachi, 9-10,000 ft.

Antennæ black, thickly covered with short stiff black pubescence; distinctly tapering towards the apex, the joints clearly separated. Head entirely black, shining, thickly covered with short stiff black pubescence. Frontal area large, bounded laterally by broad keels its lower half deeper, its sides and apex rounded, and there is a roundish flat tubercle in the centre. Clypeus obscurely, finely, and closely punctured; its apex broadly, but not deeply, incised. In the centre of the vertex is a narrow longitudinal keel; at its sides is a large deep fovea. Thorax smooth and shining; the middle lobe of the mesonotum is clearly separated, and its middle is deeply keeled. Scutellum flat; its base is obliquely narrowed—somewhat Λ -shaped and deeply separated; its apex is narrowly obscure luteous. Cenchri large, dull white. Legs thickly covered with a stiff pile; the calcaria are short; the patellæ large; the claws have a large almost straight spine near the middle. The second cubital cellule is slightly, but distinctly, longer than the third; near the base of the cubital nervure on the lower side is a short oblique projection; the accessory nervure in the hind wing is interstitial.

The male is similarly coloured; the antennæ are not much longer and hardly thinner than they are in the female.

This species was referred, in Mr. Whympers's 'Travels in the Great Andes,' p. 356, to *Strongylogaster*, but it agrees much better with *Selandria*.

A LIST OF THE LEPIDOPTERA OF ROXBURGHSHIRE.

By W. RENTON.

Concluded from p. 135.

Noctua depuncta.—More or less common at sugar in August. Widely distributed.

N. augur, *N. plecta*, *N. c-nigrum*, *N. triangulum*, *N. brunnea*, are all common.

N. festiva and var. *conflua*.—Common in the larval and perfect stages, on heath.

N. dahlii.—Collected a few on Adderstone-lea Moss, August, 1900.

N. rubi, *N. umbrosa*, *N. baia*, are also very common.

N. neglecta.—Common on Rubers-law in August. The larva in May and June on heath.

N. xanthographa.—Common and variable everywhere.

Triphæna ianthina, *T. fimbria*, *T. comes*, *T. pronuba*, are common in imago and larval stages throughout the county.

Amphipyra tragopogonis.—Common everywhere.

Mania typica, *M. maura*.—Both very common species at sugar, &c.

Panolis piniperda.—Well distributed at sallows in April; the larva on Scotch fir in August.

Pachnobia rubricosa.—Common at sallows.

Taniocampa gothica, *T. incerta*, *T. opima*, *T. stabilis*.—Common at willow catkins in April.

T. pulverulenta (cruda).—Only one or two each year.

Orthosia upsilon.—One at sugar near Hawick, July, 1901.

O. lota.—Well distributed in August.

O. macilenta.—Common everywhere in September.

Anchocelis litura.—Also a common species.

Cerastis vaccinii and *Scopelosoma satellitia* likewise common.

Xanthia citrargo, *X. fulvago*, *X. flavago*, *X. circellaris*. All more or less common.

Cirrhædia xerampelina.—Some seasons very common on ash-trunks from July to end of September.

Tethea subtusa.—Of very rare occurrence near Kelso.

Calymnia trapezina.—Common throughout the district.

Dianthæcia conspersa.—Generally scarce; in a few places, however, as at Hawick on the banks of the Teviot, it is common.

D. capsicola, *D. cucubali*, are of very common occurrence in general.

D. carpophaga.—One netted as it was flying over white campion, July, 1902, near Hawick.

Hecatera serena and *Polia chi*, with variety, all common throughout the county.

Dasypolia templi.—Generally rare. I have bred the species on cow-parsley, from ova obtained from females in May.

Aporophyla lutulenta.—A few at sugar annually in September; Kelso and Hawick.

A. nigra.—More common than the preceding species, and widely distributed.

Cleoceris viminalis.—Larva common on willows. Imago in September throughout.

Miselia oxyacanthæ, *Agriopis aprilina*, *Euplexia lucipara*, and *Phlogophora meticulosa*, all more or less common.

Aplecta herbida.—Common at sugar, 1898.

A. occulta.—A few at sugar, July and August, Cavers Woods and Minto Woods.

Hadena adusta, *H. protea*, *H. glauca*, *H. dentina*, *H. oleracea*, *H. pisi*, *H. thalassina*. All common throughout.

H. rectilinea.—A few at raspberry blossom annually, near Hawick.

Calocampa vetusta.—Rare at sugar.

C. exoleta.—Common at sugar, October, and willow catkins, April.

Cucullia umbratica.—Generally common on palings, and flying over campions.

Gonoptera libatrix.—Local, on willows.

Habrostola tripartita.—Common on nettle.

Plusia chrysitis, common. *P. bractea*, a few annually; this species is well distributed. *P. festuca*, common on Newfield Moss and Malcolm's Moss, July. *P. iota*, common everywhere. *P. pulchrina*, more local, but common where it occurs; the larva on stinging-nettle (*Urtica urens*) in May. *P. gamma*, abundant. *P. interrogationis*, common in the larval stage on heaths, Ruberslaw, Muirfield, Bellion Moor, &c., in May; imago in June and July.

Anarta myrtille.—Common on moors from May to end of July.

Chariclea umbra (marginata).—A local species; near Hawick.

Phytometra viridaria.—Local on moors.

Euclidia mi and *E. glyphica*.—More or less common throughout the county.

Catocala fraxini.—I had a specimen brought to me alive. It was taken in the vicinity of Hawick on Aug. 11th, 1898, by John Turnbull, a mill-worker, Weensland, Hawick.

Hypena proboscidalis.—Common everywhere, and *Hypenodes costastrigalis*, a few annually. These are the only two *Deltoides* that I have taken so far.

Epione vespertaria.—Occurs in one locality only—Adderstone-lea Moss, where it is fairly common in good seasons in August.

E. apiciaria.—Common near Hawick in August and September; larva on willows in June.

Rumia cratægata.—Abundant everywhere.

Metrocampa margaritaria.—Common in elm woods.

Ellopiæ prosapiaria (fasciaria).—Local in fir woods in July.

Eurymene dolobraria.—Local and rare in Wells Woods and Cavers Woods in June.

Selenia illunaria.—Common; one brood only. *S. lunaria* more rare and local throughout the county.

Odontopera bidentata and *Crocallis elinguaris*.—Common everywhere.

Ennomos tiliaria.—Very local in Hagburn and Minto Woods in September.

Himera pennaria.—Another local species; in Duke's Woods and Minto Woods in October.

Phigalia pilosaria.—Common on tree-trunks in February and March; larva found on almost any kind of tree.

Amphidasys betularia.—Common on birch, willows, &c.

Cleora glabraria and *C. lichenaria*.—Generally common, in larva and imago, wherever lichen grows.

Boarmia repandata and *B. gemmaria*.—Generally common.

Geometra papilionaria.—Of very rare occurrence.

Ephyra pendularia.—From one locality only, Wells Woods, in June.

Venusia cambrica.—Local, but common where it occurs; on mountain ash.

Acidalia bisetata.—Another local species, near Hawick and Jedburgh.

A. remutaria.—Only locality known to me is Minto Woods.

A. aversata.—Common everywhere.

Cabera pusaria.—Common; *C. rotundaria*, very rare in Adderstone-lea Moss in August; *C. exanthemata*, also common.

Macaria liturata.—Local in fir woods.

Halia warraria.—Common in gardens; larva on black and red currant bushes in May.

Strenia clathrata.—Generally scarce, but numerous in a few places.

Scodiona belgiaria.—Local in general, on moors; larva on heath, May.

Ematurga atomaria.—Common on all moors.

Bupalus piniaria.—Generally common in fir woods.

Aspilates strigillaria.—Only in one locality, Bellion Moor.

Abra-xas (*Zerene*) *grossulariata*.—Local in gardens.

A. (Z.) sylvata.—In Denholm-dene and Minto Woods only.

Lomasipilis marginata.—Common in the Kelso district.

Hybernica rupicapraria.—Abundant everywhere.

H. leucophæaria.—More local in general.

H. aurantiaria.—Very rare and local.

H. marginaria.—Common everywhere.

H. defoliaria.—Same as the preceding species.

Anisopteryx ascularia.—Another common species.

Cheimatobia brumata.—Common.

C. boreata.—More local; in birch woods.

Oporabia dilutata.—Numerous.

O. filigrammaria.—Common in birch woods.

Larentia didymata.—Common.

L. multistrigaria.—Numerous.

L. cæsiata.—Local on moors.

L. salicata.—Well distributed; in May and August.

L. olivata.—Very local; in Cavers Woods only.

L. viridaria.—Abundant everywhere.

[*Emmelesia* and *Eupithecia*, ante, pp. 60, 61].

Lobophora lobulata.—Local and rare.

Thera juniperata.—From one locality only, on junipers, Bellion Moor.

T. simulata.—Local in Wells Woods.

T. variata.—Common in all fir woods.

T. firmata.—More rare than the last named.

Hypsipetes impluviata.—Some seasons fairly common on alder and willows.

H. elutata.—Common everywhere.

Melanthia rubiginata.—Local; on Teviot Rule Water in August.

M. ocellata.—Very common.

M. albicillata.—Only in one locality—Duke's Woods, near Hawick, June and July.

Melanippe tristata.—Common on all moor lands in July.

M. rivata.—Very local, on Tofts Moor.

M. sociata.—Generally common.

M. montanata.—Abundant.

M. fluctuata.—Also abundant.

Anticlea badiata.—Larva local, on dog-rose in June. Imago in April and May.

A. derivata.—Also a local species throughout the county.

Coremia munitata.—Local, but common where it occurs.

C. propugnata.—Common in Hagburn, and Muirfield Glen, June and July.

C. ferrugata.—More or less common.

C. unidentaria.—More rare than the last.

Camptogramma bilineata.—Very numerous.

Phibalapteryx lapidata.—Very local, on Kirton Moor and Shankend Station, from Sept. 10th to 20th.

P. lignata.—Local, on Newfield Moss and Adderstone-lea Moss, in July.

Triphosa dubitata.—Local in Heronhill Wood, May, and again in September.

Cidaria siterata (*psittacata*).—Some seasons generally common.

C. miata.—Common annually throughout the county.

C. corylata.—Local in birch wood.

C. russata and *C. immanata*.—Common.

C. suffumata and var. *piceata*.—Generally abundant in April.

C. silacea.—Very local, in Cavers Wood and Minto Woods, in May.

C. prunata (*ribesiaris*).—Local in gardens.

C. testata.—Abundant on moors in August.

C. populata.—Rare on Muirfield, July.

C. fulvata.—Common among dog-rose.

C. dotata (*pyraliata*).—Also a very common species.

C. associata (*dotata*).—Common in gardens.

Eubolia limitata (*mensuraria*).—Generally abundant; found the larva on rest-harrow in June.

E. plumbaria.—Common among furze in July; larva found on furze in August and September.

Carsia paludata.—From one locality only, on Penchrist Pen, in July.

Anaitis plagiata.—From all the localities that I have collected in.

Chesias spartiata.—Local among broom.

Tanagra atrata.—Common everywhere.

Deanbrae, Hawick.

ON BUTTERFLIES COLLECTED BY MAJOR E. M.
WOODWARD IN BRITISH EAST AFRICA.

By EMILY MARY SHARPE.

(Continued from p. 126.)

62. *P. CUAMA* (*Hewits.*).—*a.* Mtoto-N'di, Ukambani; August 4, 1897.

63. *P. CERYNE* (*Boisd.*).—*a.* Campi Daraja, Nandi; March 12, 1898.

64. *CATACHROPTERA CLOANTHA* (*Cram.*).—*a, b.* Samia Hills, Kavirondo; March 7, 1898. *c.* Campi Daraja, Nandi; March 12, 1898.

65. *CRENIS OCCIDENTALIUM*, *Mab.*.—*a.* Campi Rao, Nandi; February 14, 1898. *b.* Mondo, Chagwe; February 28, 1898.

66. *C. NATALENSIS*, *Boisd.*.—*a.* Campi Rao, Nandi; March 14, 1898. *b.* Mondo, Chagwe; February 28, 1898.

67. *CYRESTIS CAMILLUS* (*Fabr.*).—*a, b.* Campi Rao, Nandi; March 13–14, 1898.

68. *PANOPEA LUCRETIA* (*Cram.*).—*a.* Campi Rao, Nandi; March 14, 1898.

69. *SALAMIS TEMORA*, *Feld.*.—*a, b, ♂ ♀.* Campi Rao, Nandi; March 14, 1898. *c, ♂.* Nandi; March 16, 1898.

70. *NEPTIS INCONGRUA*, *Butl.*.—*a, b.* Eldoma Ravine, Mau; March 20, 1898.

71. *N. WOODWARDI*, *E. M. Sharpe*; *Ann. & Mag. Nat. Hist.* (7) iii. p. 243 (1899).—*a.* Campi Rao, Nandi; March 13, 1898. *b.* Nandi; March 16, 1898.

72. *N. AGATHA* (*Cram.*).—*a, c.* Mbabani, Usoga; March 4, 1898.

73. *N. METELLA*, *Doubl. & Hewits.*.—*a.* Campi Pashto, Nandi; March 15, 1898.

74. *N. MARPESSA*, *Hopff.*.—*a, b.* Mbabani, Usoga; March 4, 1898.

75. *EURYTELA DRYOPE* (*Cram.*).

76. *EURYTELA OPHIONE* (*Cram.*).—*a.* Uganda; February 27, 1898.

77. *BYBLIA ILITHYIA* (*Drury*).—*a, b.* Mtigwa, Usoga; March 5, 1898. *c.* Wakolis, Usoga; October 15, 1897.

78. *ERGOLIS ENOTREA* (*Cram.*).—*a.* Lugumbwas, Chagwe; March 1, 1898. *b.* Campi Rao, Nandi; March 14, 1898. *c.* Nandi; March 16, 1898.

79. *HYPOLIMNAS MISIPPUS* (*Linn.*).—*a, b, ♂.* Lugumbwas, Chagwe; March 1, 1898.

80. *H. ANTHEDON* (*Doubl.*).—*a.* Kibwezi, Ukambani; August 11, 1897.

81. *HAMANUMIDA DÆDALUS* (*Fabr.*).—*a.* Samia Hills, Kavi-rondo; March 7, 1898. *b.* Muani, Ukambani; April, 1898.
82. *EURYPHENE COCALIA* (*Fabr.*).—*a.* Mondo, Chagwe; February 28, 1898.
83. *E. SOPHUS* (*Fabr.*).—*a, b, ♀.* Campi Rao, Nandi; March 14, 1898. *c, ♂.* Campi Pashto, Nandi; March 15, 1898.
84. *EUPHÆDRA INANUM* (*Butl.*).—*a.* Campi Rao, Nandi; March 14, 1898.
85. *HARMA LURIDA* (*Butl.*).—*a, ♂.* Campi Pashto, Nandi; March 15, 1898.
86. *H. HESIODUS* (*Hewits.*).—*a.* Campi Pashto, Nandi; March 13, 1898.
87. *CHARAXES CANDIOPE* (*Godt.*).—*a.* Mbabani, Usoga; April 4, 1898.
88. *C. ETESIPE* (*Godt.*).—*a.* Wakolis, Usoga; March 4, 1898.
89. *C. BRUTUS* (*Cram.*).—*a, b.* Campi Rao, Nandi; March 14, 1898.
90. *C. NUMENES* (*Hewits.*).—*a.* Campi Rao, Nandi; March 14, 1898.
91. *C. KIRKII*, *Butl.*
92. *C. ROSÆ*, *Butl.*—*a.* Campi Rao, Nandi; March 14, 1898.
93. *C. VARANES* (*Cram.*).

Family LEMONIIDÆ.

94. *LIBYTHEA LABDACA*, *Westw.*—*a, b.* Campi Rao, Nandi; March 13, 14, 1898.
95. *ABISARA GERONTES* (*Fabr.*).—*a.* Campi Rao, Nandi; March 14, 1898.

Family LYCÆNIDÆ.

96. *VANESSULA MILCA* (*Hewits.*).—*a-c, ♂ ♀.* Nandi; March 16, 1898.
97. *LACHNOCNEMA D'URBANI*, *Trim.*—*a.* Campi Rao, Nandi; March 14, 1898. *b.* Eldoma Ravine, Mau; March 23, 1898.
98. *AXIOGERSES HARPA*x (*Fabr.*).—*a, ♀.* Muani, Ukambani.
99. *A. PERION* (*Cram.*).—*a.* Campi Darajani, Nandi; March 18, 1898.
100. *CHRYSOPHANUS ABBOTTII*, *Holland.*—*a.* Campi Donalezo, Nandi; March 17, 1898.
101. *TARUCUS PLINIUS* (*Fabr.*).—*a, ♂.* Misongoleni, Ukambani; August 5, 1897. *b, ♀.* Campi Simba, Ukambani; August 15, 1897. *c, ♂.* Kibaoni, Ukambani; April 20, 1898.
102. *T. LOUISÆ*, *E. M. Sharpe.*—*a.* Misongoleni, Ukambani; August 5, 1897.

103. *NEOLYCÆNA CISSUS* (*Godt.*).—*a*, *b*, ♀. Campi Rao, Nandi March 13, 14, 1898.
104. *N. JOBATES* (*Hopff.*).—*a*, ♀. Muani, Ukambani; March 18, 1897.
105. *CATOCHRYSOPS BARKERI* (*Trim.*).—*a*, *b*, ♀. Campi Rao, Nandi.
106. *C. ASOPUS* (*Hopff.*).—*a*, *b*, ♂ ♀. Samia Hills, Kavirondo; March 7, 1898.
107. *C. OSIRIS* (*Hopff.*).—*a*, ♂. Misongoleni, Ukambani; August 5, 1897.
108. *POLYOMMATUS BÆTICUS* (*Linn.*).—*a*, *b*, ♂. Upper Kedong, Kikuyu; September 4, 1897. *c*, ♂. Campi Rao, Nandi; March 14, 1898.
109. *LYCÆNA JESOUS* (*Guér.*).—*a*, ♂. Mtoto-Ndi, Ukambani; August 4, 1897.
110. *L. ZENA*, *Moore.*—*a*, *b*, ♂. Tsavo River, Ukambani; August 24, 1897.
111. *ZIZERA KNYSNA* (*Trim.*).—*a*, *b*. Athi River, Ukambani; August 24, 1897.
112. *Z. GAIKA* (*Trim.*).
113. *CACYREUS LINGEUS* (*Cram.*).—*a*, ♂. Upper Kedong, Kikuyu; September 4, 1897. *b*, ♀. Campi Mauwi, Ukambani; August 16, 1897. *c*, ♂. Kampala, Uganda; February 27, 1898.
114. *CASTALIUS MARGARITACEUS*, *E. M. Sharpe.*—*a*, *b*, ♂ ♀. Campi Rao, Nandi; March 13, 1898. *c*. Campi Pashto, Nandi; March 15, 1898. *d*, *e*, ♂. Nandi; March 16, 1898.
115. *LYCÆNESTHES KERSTENI*, *Gerst.*—*a*, ♀. Nandi; March 16, 1898.
116. *L. AMARAH* (*Guér.*).—*a*, *b*, ♂ ♀. Mtoto-Ndi, Ukambani August 4, 1897. *c*, ♀. Campi Rao, Nandi; March 14, 1898.
117. *L. LARYDAS* (*Cram.*).—*a*, ♀. Lubwa's Hill, Usoga; January 3, 1898. *b*, *c*, ♂. Campi Rao, Nandi; March 14, 1898.
118. *L. LOCHIAS*, *Hewits.*
119. *URGNOTHAUMA FALKENSTEINII* (*Dewitz.*).—*a*. Upper Kedong, Kikuyu; September 4, 1897. *b*, *c*. Nandi; March 16, 1897.
120. *STUGETA MARMOREUS* (*Butl.*).—*a*, ♀. Mtigwa, Usoga; March 5, 1898.
121. *VIRACHOLA ANTALUS* (*Hopff.*).—*a*, ♀. Kampala, Uganda; February 27, 1898.
122. *HYPOLYCÆNA ANTIFAUNUS* (*Doubl. & Hewits.*).—*a*. Wakolis, Usoga; March 4, 1898.
123. *H. ? MERA*, *Hewits.*—*a*. Nandi; March 16, 1898.

DESCRIPTIONS OF SOME NEW SPECIES AND A NEW
GENUS OF CHRYSOMELIDÆ FROM SOUTH AMERICA.

BY MARTIN JACOBY.

MASTOSTETHUS FLAVOVITTATUS, sp. n.

Reddish-fulvous; the margins of the thorax and two curved markings on the disc, flavous; elytra closely and strongly punctured and subrugose, fulvous, a narrow oblique stripe from the base to the margin and another angulate stripe below the middle, flavous. Length 11 mill.

Hab. Marcapata, Peru.

Broad and subdepressed, entirely reddish-fulvous; the head closely punctured near the eyes with a longitudinal central groove; eyes deeply notched; antennæ pale fulvous, extending to the base of the elytra; the lower four joints shining, the rest opaque, pubescent; thorax obliquely narrowed anteriorly, the sides straight, the surface extremely finely punctured, fulvous, the margins and two semicircular marks at the middle flavous; elytra strongly and closely punctured with traces of longitudinal raised lines, each elytron with a very narrow flavous stripe, which extends from the scutellum to the middle of the lateral margin, another stripe below the middle is of less oblique direction and extends from the margin to the suture, upwards of which it is angularly continued for a short distance; under side and legs fulvous; the metasternum compressed and strongly raised.

This handsome species is quite unlike any of its allies in colouration and pattern. I have seen two similar specimens, one of which I received from Herr Bang-Haas.

MASTOSTETHUS PERUENSIS, sp. n.

Rufous; the antennæ, tibiæ, and tarsi black; thorax with four black spots; elytra closely punctured, black; a broad curved band below the middle, flavous. Length 11 mill.

Hab. Marcapata, Peru.

Head finely and closely punctured, with a small black central spot, the ground colour rufous; antennæ black; thorax very finely punctured, of usual shape, rufous, with four small black spots, placed transversely, the outer ones near the posterior angles, the others at the middle; scutellum rufous; elytra with a shallow depression near the suture, very closely punctured, black, with a broad transverse curved flavous band below the middle; tibiæ and tarsi black.

Of almost exactly similar colouration as *M. Batesi*, Baly, but of broader shape, with a feeble sutural elytral depression, the elytral band much broader, of equal width and concave, the head with only a single small black spot.

MEGALOPUS CÆRULEUS, sp. n.

Oblong and broadly subquadrate, black below, above metallic blue, finely pubescent; head and thorax extremely closely punctured; elytra with basal depression, more strongly punctured than the thorax. Length 8 mill.

Hab. Bartica, Br. Guiana.

Head very closely and finely punctured near the eyes, the central portion smooth, in shape of a narrow space, metallic blue; labrum and palpi black; antennæ black, the lower four joints shining, the rest opaque; thorax transverse, the posterior angles strongly produced outwards; the disc with a deep transverse groove near the anterior margin, and another less deep one near the base, metallic blue, very closely and finely punctured and sparingly clothed with extremely short pubescence; scutellum broad and transverse, distinctly punctured; elytra subquadrate, with a shallow transverse depression near the middle, strongly and very closely punctured, the punctures finer towards the apex, each puncture provided with a single whitish hair; under side and legs black; a spot at the flanks of the thorax near the posterior angles and the sides of the posterior femora below, flavous, the latter strongly incrassate, their tibiæ slightly curved.

This is the only metallic species of the genus with which I am acquainted, and of which I possess a single apparently female specimen.

(To be continued.)

NOTES AND OBSERVATIONS.

FURTHER NOTE ON LIPHYRA BRASSOLIS.—Mr. Dodd writes (April 6th, 1903):—"The larva as to which you now hazard a suggestion as to its being '*brassolis*' is, as I have more than once stated, *that of a moth*, whose history I am partly or wholly familiar with. It comes out of a ground ant's nest." The host ant being different, of course it cannot be "*brassolis*." I appear to have overlooked or forgotten that the "green ant" and the "ground ant" were not the same. I cannot, however, quite make the above statement, that he is familiar with its history, agree with that quoted (*ante*, p. 90), that he knows "nothing of the round segmented one, except that it is in the ants' nest and sucks their larvæ." I hope the errors and misunderstandings into which we have fallen will be ascribed to the difficulty of collating facts with the Antipodes, rather than to an excess of original sin.—T. A. CHAPMAN; Betula, Reigate: May 19th, 1903.

ATTACKS OF PARASITES ON VANESSA PUPÆ.—The note by Mr. Bird (*ante* p. 135) on this subject leads me to send you the following record. On April 8th last, I was at Pegomas (near Cannes), and noticing larvæ of *Vanessa urtica*, examined a neighbouring wall with a view to seeing how far the broods were advanced at that date. I found larvæ

crawling up to spin, others hung up for change, and some already fully pupated. Amongst others I noticed a pupa very recently changed, whose integument was quite soft, and which had not quite assumed the true pupal outlines. On this one I noticed a chalcid, with the ovipositor piercing the pupa, in the intersegmental incision between the abdominal segments six and seven. It seemed firmly fixed there, by this insertion of its ovipositor, whilst I examined it. Thinking to secure it with the pupa, however, it released itself and escaped, whilst I was loosening the pupa. On opening the pupa a day or two ago, it contained nothing but a mass of chalcid larvæ.—T. A. CHAPMAN; Betula, Reigate: May 14th, 1903.

ON THE URTICATING PROPERTIES OF CERTAIN MOTH COCOONS.—Mr. W. A. Carter's interesting remarks on the above subject (*ante*, p. 68) remind me that I have frequently experienced a similar inconvenience after handling the cocoons of certain Ceylonese moths. I would mention in particular those of *Parasa lepida*, Cram. (Limacodidæ), *Lalia suffusa*, Wlk. (Lymantridæ), and *Dasychira secura*, Hübn. (Lymantridæ). In all of these cases the symptoms have been very similar (most severe in that of *P. lepida*), consisting of an intense burning irritation and itching, greatly aggravated and extended by rubbing, but not followed by any marked pustulation. My experience leads me to believe that these symptoms are quite independent of any mechanical irritation directly due to the hairs of the larva, but are the effect of some irritant secretion present in the texture of the cocoon, possibly in the form of a fine powder. The irritation, with me, has not been the result of direct contact of the cocoon with the delicate skin of the arm, face or neck, but has been communicated to those parts by the fingers that have actually touched the cocoons. Moreover, after repeated examination of the affected parts with a high-power lens, I have invariably failed to detect the presence of any hairs or other visible particles. The thick skin of the finger-tips is proof against the irritant. The larva of *P. lepida*, the cocoon of which is associated with the most powerful urticant, is not, strictly speaking, a hairy caterpillar, though it is armed with groups of stout urticating spines. These spines are afterwards incorporated in a thin web partially surrounding the hard compact cocoon, but they are comparatively few in number, and are quite conspicuous owing to their size and black colour. If the irritation were due to them, their presence in the skin would be readily detected. With *Lalia* and *Dasychira* the symptoms were relieved by the application of common soap, but nothing seemed to allay the irritation produced by the cocoons of the *Parasa*, and time alone brought relief. Even then the unpleasantness would often recur when the place had been accidentally rubbed. The exact nature of this urticating property in the cocoons is an interesting problem that apparently still awaits solution.—E. ERNEST GREEN; Govt. Entomologist, Royal Botanic Gardens, Peradeniya, Ceylon: March, 1903.

[Packard (1898, 'Text-book of Entomology,' pp. 189-93) writes:—“Certain remarkable spines occur in limacodid larvæ, called caltrops spines, from their resemblance to the caltrops formerly used in repelling the attacks of cavalry. They are largely concerned in producing the poisonous and irritating effects resulting from contact with the cater-

pillars of these moths, and are situated in scattered groups near the end of the tubercles. . . . They are not firmly embedded in the cuticle, but on the contrary appear to become very easily loosened and detached, and they probably, when brought into contact with the skin of any aggressor, burrow underneath, and are probably in part the cause of the continual itching and annoyance occasioned by the creatures. . . . The body of the spine is spherical, with one large, elongated, conical spine arising from it, the spherical base being beset with a number of minute, somewhat obtuse spinules." Packard also describes the large hollow bristles or spines in *Lagoa*, *Orgyia*, &c., "filled with a poisonous secretion formed in a single large, or several smaller specialized hypodermal cells situated under the base of the spine."—G. W. KIRKALDY.]

AUSTRALIAN LEPIDOPTERA AND SUGAR.—It has been a never-failing source of wonder to me why Lepidoptera in these climes persistently refuse to be lured to their destruction by the intoxicating delights of sugar. When first I started experimenting I attributed my non-success to the mixture, but obtaining the same result time after time from sugar prepared most carefully from the best recipes, I came to the conclusion the moths were at fault and not the mixture. Not only have I experimented on the outskirts of the city, but also away back in the bush, in places where one would imagine moths would tumble over one another in their haste to get there first; but all to no purpose. Night after night I would go round in hopes that my luck would at last change, but it was always the same tale. A friend in New South Wales has informed me that his experiences exactly tally with mine. He even went to the trouble of importing some sugar already made up. It was, however, no better: cockroaches, earwigs, and such-like are the only insects one finds on one's rounds.—FRANK M. LITTLER; Launceston, Tasmania: March 16th, 1903.

EPIDEMIC AMONG CATERPILLARS.—On several occasions when rearing in breeding-cages a number of larvæ of Lepidoptera (especially hairy ones), I have found that after having successfully completed their last moult they ceased to feed and went limp. Some would make an attempt to spin, but after getting a little way would cease, shrivel up, and die. Others would shrivel and die without attempting to spin. In this way I have at various times lost several hundred larvæ. The caterpillars always had plenty of suitable food, light, and air. Just recently I had a hundred and seventy larvæ of a *Darata* hatch; these I reared without a loss until just full-fed. One morning on going to the cages I found many of the caterpillars limp and listless. I at once removed them to fresh cages, hoping to stay the disease, but all to no purpose, only forty spinning out of the lot. I have tried changing the food, and all kinds of things, but without success. If any other entomologists have had similar experiences, I should very much like to know their opinion on the subject, to what they attribute the epidemic, and how to combat it. It appears to me that what I have to do in the future is not to keep more than, say, a dozen in each cage; then, if one lot sickens, there is not the likelihood of an epidemic setting in.—FRANK M. LITTLER; Launceston, Tasmania: March 16th, 1903.

NATIONAL COLLECTION OF BRITISH LEPIDOPTERA.—In response to our appeal for help in perfecting this collection, Mr. William M. Christy, of Watergate, Hants, has been good enough to send to the Natural History Museum at South Kensington a fine collection of moths from Shetland, together with some local forms of other species. We hope that further assistance may be given during the season. (For lists of species wanted, please refer to p. 135.)

THE NAME MICROPYGA.—I do not see how an author can excuse himself for proposing new generic names without taking the slightest trouble to see whether they have been used before. If Mr. Jacoby (cf. Entom. p. 92) had consulted the 'Nomenclator Zoologicus' he would have found *Micropyga*, Agassiz, 1879, which quite precludes the use of the same name for his beetle-genus. There are also extant *Micropyge*, Hawle, and *Micropygia*, Bonaparte, though these are properly regarded as different names.—T. D. A. COCKERELL.

BIRDS ATTACKING LEPIDOPTERA.—With reference to Mr. W. Parkinson Curtis's note (*ante* p. 68) *re* "Kestrel destroying butterflies," I should like to record that, on July 18th, 1897, at Addington, Surrey, I had a specimen of *Argynnis adippe* under my net, which, however, managed to escape, but after chasing it some distance it settled on the ground, and before I had time to again net it, a bird dashed at it, and soon made short work of it. Unfortunately I did not note to what species the bird belonged (it was certainly not so large as a thrush), as the whole thing was over so quickly, and I was pretty well "done up" after my run, and chagrined at the loss of the insect, as I had never before seen the butterfly there, nor since. Again, I have a note in my diary, on March 13th, 1899, of watching a sparrow chasing a specimen of *Vanessa urticae* at Whitstable, which it captured. On June 14th, 1901, I found a great many full-grown larvæ of *V. polychloros* wandering about the road near Brockenhurst station, and while taking a number I noticed that some thrushes were as busily engaged as I was, and one flew quite close to me with two larvæ in its beak. I send the above notes, as I heard it asserted the other day that birds do not attack butterflies.—C. W. COLTHRUP.

CAPTURES AND FIELD REPORTS.

SPRING NOTES (1903) IN WILTS AND HANTS. — Early in January *Hybernia defoliaria* was observed at Salisbury. The evening of Feb. 3rd being very mild, I went round the street-lamps, but only saw males of *Cheimatobia brumata*. During this month *Phigalia pilosaria*, *Hybernia marginaria*, and *H. leucophaaria* were also about. Owing to the mild weather vegetation was very forward, hawthorn bushes in sheltered positions being actually in leaf on Feb. 10th. March continued mild, and many sallows were in full bloom the first week. Blackthorn blossoms were seen on the 4th. *Gonepteryx rhamni* and *Vanessa urticae* were both on the wing. *Xylina rhizolitha*, *Xylocampa lithorhiza*, *Hybernia rupicapraria*, *H. marginaria*, *Eupithecia abbreviata*, and *Diurnea fagella* were seen; whilst at sallows, which I had no opportunity of

properly working, *Teniocampa stabilis*, *T. gothica*, and *Cerastis vaccinii* occurred. A few larvæ of *Cleora lichenaria* were obtained in a beech-wood.

On March 13th I "biked" to Lyndhurst, and found *Brephos parthenias* fairly common, but did not succeed in taking any. *Vanessa urticæ*, *Phigalia pilosaria*, and *Hybernia marginaria* were the only other Lepidoptera seen.

With April the spell of mild weather came to an end. I was unable to do much collecting at Salisbury, but took a good male *Amphidasyus prodromaria* from a street-lamp on the 1st, and subsequently saw one or two more. *Pieris rapæ* appeared on the 3rd; and other insects noticed were *Teniocampa stabilis*, *T. gothica*, *Phlogophora meticulosa* (one at fallows), *Hybernia marginaria*, *Anisopteryx æscularia*, and *Diurnea fagella*. Larvæ of *Odonestis potatoria* were found on the 18th, when a small *Arctia caia* was also seen. A larva of *Lasiocampa (Bombyx) quercus* was beaten from hawthorn. *Oporabia dilutata* larvæ were noticed, and *Eupithecia sobrinata* beaten from juniper bushes on the hills near Dean. Larvæ-searching one evening, with an acetylene lamp, showed up a few *Triphæna fimbria*, a very large number of *T. comes* (?) feeding on bramble, blackthorn, and almost anything, and *Uropteryx sambucaria*. On the 4th I walked about four miles out of Salisbury to see a friend, and found larvæ of *Sesia tipuliformis* in the currant-bushes in his garden. He showed me *Plusia moneta* which he captured in his garden last year, and on searching *Delphinium* there we found two small larvæ. I have since searched both monkshood and *Delphinium* in the garden here, and been rewarded by seven larvæ found in the heads of one plant of monkshood, and a few odd ones on *Delphinium*. I also found four other larvæ on *Delphinium*, in a garden at Northwood, Middlesex, on April 30th. Some of the larvæ spun up on May 18th, but others were not half-grown at that time.

We have, up to the present, had such bad weather in May that I have only ventured out once, which was on May 15th, to Wilton. Two very fine *Lithosia sororcula (aureola)* were on this occasion beaten from birch, whilst continuous searching of tree-trunks only produced one *Tephrosia crepuscularia*, two *T. punctulata*, and one *Panagra petrarua*. *Asthena candidata* was beaten. Larvæ noticed were *Cheimatobia boreata* (abundant on birch), *C. brumata*, *Oporabia dilutata*, *Phigalia pilosaria*, and *Hypsipetes clutata*. *Melanippe fluctuata* is the only other moth noticed so far this month.

Easter was spent in the New Forest with my father. The weather got colder and colder until the last day of my stay (April 13th), when we actually had a snowstorm. Butterflies were not much in evidence, *Gonepteryx rhamni* being by far the commonest, with occasional examples of *Vanessa polychloros* and *V. urticæ*. *Pararge eyeria* was taken April 10th, and another seen two days later. A few *Sarothrips undulans* were taken. Is this moth double-brooded, or are the individuals seen in the spring hibernated specimens? I should be glad to know this, as I cannot make out from the only book I have at hand, though their condition suggested hibernation. After much searching, about a dozen *Boarmia cinctaria* were found in different parts of the forest, five of them being captured between the snow showers. A fine *Lobophora viretata* was netted as it flew off a holly-trunk. A short series of

Aleucis pictaria was obtained, flying round or settled on the blackthorn bushes at night. A special point was made of working for this moth, as we had not previously taken it. Blackthorn bloom was rather better than the shallows, which were nearly all over, a nice series of *Pachnobia rubricosa* being obtained from the former.

The following is a list of the remaining moths noticed:—*Trachea piniperda*, *Xylocampa lithorhiza*, *Xylina rhizolitha*, *Cerastis vaccinii*, *Tæniocampa stabilis*, *T. pulverulenta* (*cruda*), *T. gothica*, *T. miniosa*, *T. munda*, *Brephos parthenias* (two), *Selenia illunaria*, *Tephrosia bistortata*, *Anticlea badiata*, *A. nigrofasciaria*, *Eupithecia abbreviata*, *E. pumilata*, and *Hybernia marginaria*. With regard to the last named, the males were in dozens one very cold evening (April 12th), flitting about in a fir and oak plantation, and settled on trunks and twigs of both trees, but more abundantly on the firs. Very few were noticed elsewhere. Could this possibly be a case of "sembling"? If we had tried we could have taken about fifty in a quarter of an hour. A long search for larvæ of *Limenitis sibylla* only revealed four very small ones. Other larvæ noticed were *Psilura monacha* (one from fir), *Tæniocampa quercus* (from ling), *Agrotis agathina* (ling), *Triphena fimbria*, *T. comes*, and *Noctua* (? *triangulum*), the last three species by searching with the lantern after dark—*Miselia oxyacantha*, *Catocala sponsa* (one), *Rumia luteolata* (*crategata*), *Crocallis elingvaria*, *Metrocampa margaritaria*, *Ellopiæ fasciaria* (about four dozen), *Cleora lichenaria*, *C. glabraria* (three), *Thera variata*, *T. firmata*, *Abraxas grossulariata*, and *Cidaria truncata* (honeysuckle).

From the above it will be seen that, in spite of the weather, we had a considerable amount of success.—F. M. B. CARR; The Choir School, The Close, Salisbury: May 17th, 1903.

RECENT LITERATURE.

Proceedings of the South London Entomological and Natural History Society, 1902. Pp. 126. Two Plates and a Chart. Hibernia Chambers, London Bridge, S.E. 1903.

ALTHOUGH it does not contain so many pages as some of those previously published by this Society, the present volume cannot be regarded as retrogressive. Among the papers, seven in number, are two or three dealing with entomological matters. "A Life Cycle of *Acidalia marginepunctata*, Göze (*promutata*, Gn.), and other Notes on the Species," by Mr. Robert Adkin, is exceedingly interesting and instructive reading; while the paper by Dr. Chapman on "Inflation in insects" which deals with the mechanics connected with the emergence of the imago from the pupa, and the subsequent expansion of the wings, should attract attention to a promising field of investigation. The subject discussed by Mr. F. Noad Clark belongs to the Crustacea, but his paper on *Argulus foliaceus* is of considerable importance as a contribution to the life-history of the "fish-louse," and it is accompanied by two excellent plates of structural details from photos taken by the author.

Transactions of the City of London Entomological and Natural History Society for the year 1902. Pp. 72. The London Institution, Finsbury Circus, E.C.

THIS publication contains, in addition to other interesting entomological matter, some important papers. One of these, by Mr. Alfred Sich, is entitled "Observations on the Early Stages of *Phyllocnistis suffusella*, Zell." Another, by Mr. A. Bacot, is on the "Importance of certain Larval Characters as a guide in the Classification of the Sphingids." Mr. W. J. Kaye contributes an account of his travels and collecting experiences in British Guiana.

A List of Lepidoptera found in the counties of Cheshire, Flintshire, Denbighshire, Carnarvonshire, and Anglesea. Compiled and edited by GEORGE O. DAY, F.E.S., with the assistance of J. Arkle, Herbert Dobie, M.D., and Robert Newstead, A.L.S., F.E.S. 8vo. Pp. 120. Grosvenor Museum, Chester 1903.

ALTHOUGH based on the Walker list (1885), the nomenclature and classification of the Staudinger and Rebel Catalogue have been adopted. Over 680 species are enumerated, and of these only 123 belong to the families included in the old division of "Micro-Lepidoptera." The list bears evidence of careful preparation, and will be of value to students of distribution as well as to the local lepidopterist.

A List of North American Lepidoptera, and Key to the Literature of this Order of Insects. By HARRISON G. DYAR, Ph. D. (assisted by C. H. Fernald, Ph. D., the late Rev. G. D. Hulst, and August Busck). Bulletin of the United States National Museum, No. 52. 8vo. Pp. 723. Government Printing Office, Washington. 1902.

DR. DYAR and those who co-operated with him are to be congratulated on the successful completion of this laborious work. The "List" will no doubt command in America the same position that the "Catalog" holds in Europe. The plan of arrangement will be gathered from the following extract from the preface:—"Within the last ten years the classification of the Lepidoptera has been radically altered. No exact consensus of opinion as to the proper sequence of families and genera has been reached, but the recent workers are so closely in accord as to the principles involved and the resultant general scheme, that we seem to be somewhere near a natural classification. In the present list I have followed my own views, based largely on larval characters, in the arrangement of the family and super-family groups. The system does not differ in general from that of Edward Meyrick, which has been adopted by the British Museum in the Catalogue of the Lepidoptera Phalaenæ, though the order of groups is somewhat different. I have placed the butterflies first, since they seem on the whole 'higher' than the moths, and this course agrees with the usual custom. I follow with the Sphingidæ and Saturnians for the same reasons, although, in variation, they are more generalized than some of the Noctuid groups. The list, as a whole, proceeds from higher to lower forms, as in Staudinger and Rebel's Catalogue." According to the present census, 6622 species of Lepidoptera are known to occur in America north of Mexico; about 240 of these are European, and, with few exceptions, are found in Britain.

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NOTES ON THE BEE: GENUS *APIS*.

By T. D. A. COCKERELL.

AN examination of the mouth-parts of three species of *Apis* shows great uniformity; the maxillary palpi are always two-jointed, notwithstanding the statement of all authors examined to the contrary. The species studied can be separated thus:—

1. Second joint of labial palpus about 420 μ long . . . *indica*, Fabr. ♂.
2. Second joint of labial palpus about 600 μ long
in ♂ 3.
3. "Spoon" at end of tongue long and narrow, about
150 μ long, 80 broad *dorsata*, Fabr.
- "Spoon" at end of tongue circular, about 100 μ
long, 110 broad *ligustica*, Spin.

The difference in the "spoon" between the last two was observed and pointed out to me by Miss Irma Bell, one of my students. The second joint of labial palpus in *dorsata* may measure as much as 650 μ , but this "giant" bee has the mouth practically of the same size as the Ligurian bee. The second joint of labial palpus in the male *ligustica* is comparatively short, only about 450 μ . I am indebted to Mr. E. E. Green for material of *indica* and *dorsata*; *ligustica* is the form of the honey-bee common in New Mexico.

Apis is usually placed at the head of the bees, and regarded as the extreme limit of bee-development. It is of course greatly specialized in its mouth-parts, its habits, &c.; yet it retains some very primitive characters. The venation of the wings is very wasp-like. The peculiar submarginal cells suggest those of *Notogonia*, *Tachytes*, or *Laphyragogus*. The long marginal cell and the form of the eyes in the male recall the primitive bee genus *Protoxæa*. The shape of the marginal cell, and the venation approaching the apical margin of the wing, suggest the wasp *Monedula*; and it is to be remarked that some genera of

Bembicini have only three-jointed maxillary palpi. I think it is certain that *Apis* has no particular relationship with the ordinary long-tongued bees, such as *Anthophora*, &c.; so far as blood-relationship goes, it must be nearer to some of the primitive bees.

P.S.—When I say that certain characters of *Apis* are primitive, I mean that they are wasp-characters not ordinarily found among bees. Regarding the matter from a broader standpoint, the characters are not primitive; and no doubt a square wing-cell is more primitive than a long or triangular one. The point is that the bees are derived from the wasps, and it is not probable that such wasp-characters as *Apis* shows would reappear after being absent in a long series of bee ancestors.

East Las Vegas, New Mexico, U.S.A.: May 14, 1903.

DESCRIPTION OF A NEW SPECIES OF *AMMOPLANUS* (HYMENOPTERA) FROM SOUTH AFRICA.

By P. CAMERON.

AMMOPLANUS *MANDIBULARIS*, sp. nov.

Black, the mandibles and fore knees pale testaceous, the flagellum of the antennæ brownish beneath; the wings hyaline, the large stigma black, pale at the base. ♀. Length 2 mm.

Hab. Pearston, South Africa; Dr. Robert Broom, C.M.Z.S.

Smooth, shining, the median segment aciculated; the base of the antennæ brownish; the scape not quite reaching to the middle of the head and not to the top of the eyes; the pedicle twice longer than broad, the following joint is about equal in length to it. Propleuræ with a wide furrow in the centre, which becomes narrowed towards the apex; the metapleuræ obscurely striated; the striæ are roundly curved; there is a round shallow fovea on the mesopleuræ. Metanotum opaque, strongly aciculated, obscurely furrowed in the middle. The lower abscissa of the radius is straight and oblique, not roundly curved, as in *A. perrisii*. The metatarsus pale. The eyes on the inner side below distinctly curve inwardly.

The genus *Ammoplanus* is of small extent, and hitherto has only been recorded from the Palæarctic and Nearctic Zoological Regions.

MISCELLANEA RHYNCHOTALIA.—No. 7.

By G. W. KIRKALDY.

Fam. TETIGONIIDÆ (including MEMBRACINÆ).

CYRTOISA, Fitch=*Cyrtosia*, Stål=*Cyrtolobus*, Goding.

This genus was spelt as above by Fitch, and is not preoccupied.

Fam. FULGORIDÆ.

CATHEDRA, gen. nov.

Head subhorizontal, slightly upcurved at the apex, where it is acutangular and simple (instead of being trilobate as in *Phrictus*, Spinola); head also much longer than in the latter genus, and is laterally multidentate, the teeth being acutely triangular; the vertex is somewhat obtusely spinose below the eyes, sublaterally, while in *Phrictus* it is provided with a strong, acute, upcurved spine on each side. Pronotum much flatter than in Spinola's genus, the posterior margin truncate and not spinose. Elytra more pointed apically, the costa more arched, and the costal area broader.

Type, *P. serrata* (Fabricius), which, apart from the structural differences, has a very different colour-appearance from *Phrictus diadema* (Linné), the only species of that genus, as *serrata* is of *Cathedra*, known to me; the latter is figured by Stoll, 1788, "Cicaden," pl. 29, figs. 170 and A. Stål includes it in his genus *Laternaria* (= *Fulgora*, Linn., Kirk.), an obvious lapsus.

PERKINSIELLA, gen. nov.

Closely allied to *Aræopus*, Spinola, but distinguished by the first segment of the antennæ being distinctly shorter than the second; distinguished from *Dicranotropis*, Fieber, to which it bears some resemblance, by the form of the frons, and by the flattened apically dilated first segment of the antennæ. Type, *P. saccharicida*, Kirkaldy.

Second segment of antennal peduncle about one-half longer than the first; flagellum about one-third longer than the entire peduncle, first peduncular segment much wider at apex than basally, flattened and explanate; second segment nearly as wide at base as the apex of the first segment [in *Aræopus* it is much narrower, while the first segment is more parallel-sided]. Exterior longitudinal nervure of corium forked near the base, and its exterior branch forked near its middle; interior longitudinal nervure forked near the apex. Membrane with six nervures, the fourth (commencing inwardly) forked; the first area has an incomplete nervure reaching only to the middle. Other characters as in *Aræopus*.

P. SACCHARICIDA, sp. nov.

Long-winged form, ♂ ♀. Tegmina elongate, narrow, extending far beyond apex of abdomen, interior half of clavus and corium more or

less faintly smoky, a long dark smoky stripe on middle of membrane, three or four of nervures of the latter smoky at apex.

Short-winged form, ♀. Tegmina reaching only to base of fifth segment, costa more arched, apex more rounded, neuration similar but shortened. Tegmina hyaline, colourless; nervures pale testaceous brownish, with blackish brown non-piligerous dots (in both forms).

♂. Pallid yellowish testaceous. Abdomen above and beneath black, apical margins and laterally more or less widely pallid. Apical half of first segment and carinate edges of second segment of antennæ, flagellum, basal half of frons (except the pustules) and a cloudy transverse band near the apical margin of the same, longitudinal stripes on femora, coxæ spotted or banded near the base, a large spot on each pleuron, anterior and intermediate tibiæ with two or three annulations, apical segment of tarsi, &c., blackish or brownish. First genital segment large, deeply acuteangularly emarginate above.

♀. Like the male, but abdomen above and beneath stramineous, irregularly speckled with brownish. Ovipositor, &c., blackish. Sheath not extending apically so far as the "scheidenpolster." Long. ♂ ♀ $4\frac{1}{2}$ mill.; to apex of elytra in long-winged form, $6\frac{1}{4}$ mill.

HAWAIIAN ISLES: Oahu, Honolulu; destructive to sugar-cane. Is destroyed by the Reduviid *Zelus peregrinus*, Kirkaldy.

I have much pleasure in naming this interesting genus after Mr. R. C. L. Perkins, who has contributed more than any other man to our knowledge of the fauna of the fascinating Hawaiian Archipelago. As Mr. Perkins will shortly publish an exhaustive account, with figures, &c., of this sugar pest, I have here merely established the genus and species. It may be added, however, that the nymphs are important, as showing a different head structure from the adults; in the former the frons is somewhat widely bicarinate, slightly outcurved, but subparallel, the two keels remaining separate from base to apex. It is probable that a comparative study of the nymphs in the Asiracinae would give valuable hints as to the true affinities of the various genera in this very difficult and at present unsatisfactorily disposed subfamily.

Fam. GERRIDÆ.

MICROVELIA SINGALENSIS, sp. nov.

Allied to *M. loriæ*, Kirkaldy, but more elongate, the eyes larger, different proportions to the legs, &c.

Elongate, abdomen subparallel laterally. Blackish, with silvery pilosity along the lateral margins of the head dorsad to the eye, anterior margin of pronotum, coxæ, femora, &c. First segment and basal two-thirds of second segment of antennæ, ambulacra, legs (except apical segment of tarsi), stramineous. Head beneath, clypeus, rostrum (except fourth segment), connexiva, and lateral margins of abdomen beneath (at least basally), also apical abdominal sternite (more or less), and genital segment beneath, flavescent. Apical segment of tarsi, and third and fourth and apex of second segment of antennæ infusate. Vertex narrowly longitudinally sulcate. Rostrum reaching to about

one-fourth of the length of the mesosternum. Fourth segment of antennæ slender, tapering, one-half longer than third, which is one-fourth longer than the first, the latter being slightly longer than the second. Pronotum carinate for three-fourths of its length; posteriorly triangular, obtusely rounded. Elytra dark fumate, with five or six bluish white more or less wedge-shaped spots. Second segment of intermediate tarsi very slightly shorter than the third. Posterior femora simple, second and third segments almost subequal, second very slightly the longer.

♂. Abdominal tergites carinate medio-longitudinally (except the first). Last "abdominal" tergite deeply, almost circularly emarginate.

♀. Last three or four abdominal tergites carinate. Last "abdominal" tergite truncate. A little stouter than the male. Long. 1.6 to 1.7 mill., lat. 0.75 mill.

Hab. Ceylon, Pundaluoya (March, E. E. Green). Only the macropterous form known.

GERRIS SELMA, sp. n.

Belongs to typical subgenus (= *Limnotrechus*, Stål), and is allied to *G. costæ*, H.-Schäffer, but is larger, more elongate, the posterior margin of pronotum more rounded and more widely reflexed; the metasternal tubercle is much nearer to the posterior margin of the metasternum, &c. Closely allied also to *G. gracilicornis* (Horváth), but in the latter the abdominal sternites are not depressed on each side of the carina.

Head above and beneath, anterior lobe of pronotum, apical segment of rostrum, ventral surface, anterior tarsi, &c., blackish, the head and pronotum covered with short olive-brown pubescence, the ventral surface with velvety pale greenish yellow pubescence. Extreme apex of head, a small wedge-shaped spot anterior to the eyes, an obtuse V-shaped mark at base of vertex, the median line on the anterior lobe of pronotum, ambulacra in part, lateral margins of abdominal sternites, apical margin of seventh abdominal sternite, genital segments, &c., flavo-fulvescent. Rostrum and anterior legs sordid flavescent; intermediate and posterior legs fulvous, more or less darkened; antennæ, posterior lobe of pronotum, lateral margin (as seen dorsally) of anterior lobe, connexival tergites, elytra, &c., dark fulvous. Metasternal tubercles black. Abdominal sternites carinate, each comparatively considerably depressed on each side of the keel. First segment of intermediate tarsi two and a quarter times as long as the second (female), nearly three times (male).

♂. Anterior tibiæ slightly curved; seventh abdominal sternite apically deeply emarginate.

♀. Apical margin of seventh sternite subtruncate, very slightly obtusely pointed in the middle. Long. ♂ 12½, ♀ 15-15½ mill.

India, Sikkim (colln. Kirkaldy); Kurseong (Mus. Belge).

Variable in shades of colouring, &c., as are its allies. A series of colour-varieties from different localities would be interesting.

DESCRIPTIONS OF SOME NEW SPECIES AND A NEW
GENUS OF CHRYSOMELIDÆ FROM SOUTH AMERICA.

By MARTIN JACOBY.

(Continued from p. 170.)

MEGALOPUS BRASILIENSIS, sp. n.

Black, closely pubescent; head finely rugose; thorax closely punctured, the sides dark brown, the disc piceous; elytra dark chestnut-brown, shining, the base strongly raised, the apex pubescent; legs black. Length 7 mill.

Hab. St. Catarina.

Short and subquadrate; the head finely rugose, black; antennæ entirely black; thorax transversely subquadrate, with a transverse anterior and posterior groove, the surface finely punctured, with a narrow central longitudinal ridge, nearly black, the sides dark brown, clothed with long black pubescence like the head; scutellum broad, brownish, pubescent; elytra with the basal portion raised into high round callosities; the shoulders acutely raised, the surface of a shining dark chestnut brown, sparingly punctured near the base, the apical portion likewise raised and more closely covered with black hairs, forming a small tomentose patch on each elytron; under side and legs likewise covered with long black and grey hairs; posterior femora incrassate, their tibiæ straight.

Of this species I possess a single female specimen only. The insect is closely allied to *M. pilipes* Lac., but differs in its short and subquadrate shape and the colour of the elytra and that of the legs, which are entirely black.

MEGALOPUS THORACICA, sp. n.

Short and narrowly elongate, flavous; antennæ (the basal joint excepted) black; head at the vertex and a transverse band between the eyes blackish; thorax closely and distinctly punctured, a band at each side, and a triangular spot at the middle, black; elytra finely pubescent, the sides obscure fuscous. Length 7 mill.

Hab. Jalahy, Prov. Goyaz, Brazils.

This species is so closely allied to *M. brevipennis* in every respect, that I am somewhat doubtful as to its specific distinction, but the different sculpture of the thorax seems to suggest another species; but this is the only difference, and sufficient to distinguish it for the present. In *M. brevipennis* the thorax is finely and closely rugose, punctate, and opaque. In the present insect it is shining, the punctures are larger and distinctly separated, and instead of an M-shaped mark there is a triangular central patch and a narrow band at each side; the suture at the middle has also a small fuscous spot. I have also received two female specimens from the same locality which agree entirely in structural details, but not in colouration, as the thorax is black, with the sides and two small oblique streaks flavous; the last

two-thirds of the elytra are fuscous, and the apex of the tibiæ and the tarsi are black. Whether these forms represent the female sex of the present species, which I am inclined to believe, or again another closely allied insect, more material will show.

MEGALOPUS BREVIPENNIS, sp. n.

Narrow and short, flavous; antennæ black; head with two transverse bands; thorax very finely and closely punctured, with an M-shaped mark; elytra finely sericeous, the base flavous, the rest pale fuscous.

Mas. Posterior femora fulvous, strongly incrassate, unarmed; tibiæ robust, simple, slightly curved. Length 7 mill.

Hab. Jalahy, Prov. Goyaz, Brazils.

Head extremely closely and finely rugose, flavous; the vertex and a broad band between the eyes piceous, the latter triangularly but not deeply notched; antennæ black, the basal joint fulvous; thorax slightly broader than long, subcylindrical, sculptured like the head, finely pubescent, flavous, with an M-shaped dark brown mark; scutellum flavous; elytra obliquely depressed below the base, the latter shining, flavous, the rest of the surface clothed with short pale pubescence, obscure fuscous, below flavous, the sides of the breast with an oblique piceous stripe; abdominal segments also marked with obscure fulvous or piceous; legs fulvous.

This is a shorter species than any of the rest of the genus with which I am acquainted, and of finely sericeous not shining appearance. The femora of the male are unarmed.

OTILEA ORNATA, sp. n.

Elongate, narrowed posteriorly, fulvous, above metallic green, with a fulvous stripe; the apical joints of the antennæ black; thorax with the lateral margins dentate, metallic green, the disc dark fulvous; elytra similarly coloured, deeply foveolate punctate, the sides transversely rugose, metallic green, a broad sutural stripe dark fulvous. Length 10 mill.

Hab. Marcapata, Peru.

Head very closely punctured, metallic green, deeply depressed between the eyes, the depressions more strongly punctured; labrum and palpi fulvous; antennæ slender, filiform, fulvous, the terminal five joints black, third and following joints elongate, nearly equal; thorax strongly transverse, the lateral margins widened at the middle and bidentate, the middle of the disc very deeply but not closely punctured, fulvous, in shape of a broad band, the sides bright metallic green, deeply and coarsely rugose and punctured, the rugosities partly confluent; scutellum metallic green; elytra with two rows of deep punctures near the suture, the sides very deeply and confluent foveolate punctate and transversely rugose, metallic green, a broad, posteriorly narrowed sutural band dark fulvous; under side and legs fulvous, the first joint of the posterior tarsi as long as the following joints together; prosternum bilobed, narrowed medially.

Of this very handsome and peculiarly marked species I received lately a single apparently female specimen.

(To be concluded.)

ON LEPIDOPTERA COLLECTED BY MAJOR E. M.
WOODWARD IN BRITISH EAST AFRICA.

By EMILY MARY SHARPE.

(Concluded from p. 168.)

Family PIERIDÆ.

124. NYCHITONA MEDUSA (*Cram.*)—*a.*

125. N. IMMACULATA (*Auriv.*)—*a-c.* Campi Rao, Nandi; March 13-14, 1898.

126. N. NUPTA, *Butl.*—*a, b.* Kampala, Uganda; February 27, 1898. *c.* Campi Rao, Nandi; March 14, 1898. *d-e.*

127. TERIAS ZOE, *Hopff.*—*a.* Kenani, Ukambani; August 3, 1897. *b.* Mtoto-Ndi, Ukambani; August 4, 1897.

128. T. HAPALE, *Mab.*—*a.* Mtoto-Ndi, Ukambani; August 4, 1897. *b-d.* Mondo, Chagwe; February 28, 1898. *e.*

129. T. MARSHALLI, *Butl.*—*a.* Wakolis, Usoga; October 15, 1897.

130. TERACOLUS CALAIS (*Cram.*)—*a.* Campi Simba, Ukambani; August 15, 1897.

131. T. CHRYSONOME (*Klug.*)—*a.* Kenani, Ukambani; August 3, 1897. *b.* Mtoto-Ndi, Ukambani; August 4, 1897.

132. T. AURIGINEUS, *Butl.*—*a.* Muani, Ukambani; March 18, 1897. *b.* Eldoma Ravine, Mau; March 22, 1898.

133. T. EVENINA (*Willgr.*)—*a.* ♀. Tsavo River, Ukambani; August 1, 1897. *b,* ♀. Muani, Ukambani; August 17, 1897.

134. T. ITHONUS, *Butl.*—*a* ♂. Kenani, Ukambani; August 3, 1897. *b,* ♀. Campi Simba, Ukambani; August 15, 1897. *c,* ♀. Campi Mauwi, Ukambani; August 16, 1897. *d,* ♀. Muani, Ukambani; August 17, 1897.

135. T. COMPTUS, *Butl.*—*a,* ♂. Tsavo River, Ukambani; February 31, 1897. *b,* ♀. Kibwezi, Ukambani; August 9, 1897. *c,* ♂. Kibaoni, Ukambani; April 20, 1898. *d,* ♀.

136. T. ACHINE (*Cram.*)—*a,* ♀. Kiboko River, Ukambani; April 25, 1898.

137. T. OMPHALE (*Godt.*)—*a,* ♂. Kenani, Ukambani; August 3, 1897. *b,* ♂. Upper Kedong, Kikuyu; September 4, 1897. *c,* ♂. Eldoma Ravine, Mau; March 23, 1898. *d, e,* ♂ ♀.

138. T. PALLENE (*Hopff.*)—*a,* ♀. Makindo River, Ukambani, August 14, 1897.

139. T. PSEUDACASTE, *Butl.*—*a,* ♀. Makindo River, Ukambani; August 14, 1897. *b,* ♂. Muani, Ukambani; August 17, 1897. *c,* ♂. Kibaoni, Ukambani; April 20, 1898.

140. T. ERIS (*Klug.*)—*a,* ♂. Mtoto-Ndi, Ukambani; August 4, 1897. *b,* ♂. Campi Simba, Ukambani; August 15, 1897.

141. *T. CELIMENE* (Lucas).—*a*, ♂. Mesongoleni, Ukambani; August 5, 1897. *b*, ♀. Campi Rao, Nandi; March 13, 1898.

142. *T. ELGONENSIS*, *E. M. Sharpe*.—*a*, ♂. Campi Rao, Nandi; March 13, 1898. *b*, ♂. Nandi; March 16, 1898. *c*, ♂. Eldoma Ravine, Mau; March 20, 1898.

143. *T. PUNICEUS* (Butl.).—*a*, *b*, ♂. Campi Mauwi, Ukambani; August 16, 1897. *c*, ♂. Mtoto-Ndi, Ukambani; August 14, 1897.

144. *T. LEO* (Butl.).—*a*, ♂. Kiboko River, Ukambani; September 25, 1898. *b*, ♀.

145. *T. CATOCHRYSOPS*, *Butl.*.—*a*. Mtoto-Ndi, Ukambani; August 4, 1897.

146. *T. AUXO* (Lucas).—*a*, ♂. Mtoto-Ndi, Ukambani; August 4, 1897. *b-d*, ♂ ♀. Muani, Ukambani; August 17, 1897.

147. *PINACOPTERYX ORBONA* (Hübner).—*a*, ♀. Upper Kedong, Kikuyu; September 4, 1897. *b*, ♂. Lugumbwas, Chagwe; March 1, 1898.

148. *COLIAS EDUSA* = *ELECTRA* (Linn.).—*a*. 1st Swamp, Kikuyu; September 3, 1897. *b*. Eldoma Ravine; March 20, 1898.

149. *BELENOIS MESENTINA* (Cram.).—*a*, ♂. Campi Aziwa, Nandi; March 19, 1898.

150. *B. SEVERINA* (Cram.).—*a*, *b*, ♂ ♀. Campi Mauwi, Ukambani; August 16, 1897.

151. *B. INFIDA*, *Butl.*.—*a*, ♂. Muani, Ukambani; August 17, 1897. *c*, ♂. Kibaoni, Ukambani; April 20, 1898. *b*, ♀. Campi Rao, Nandi; March 14, 1898.

152. *B. DENTIGERA* (Butl.).—*a*, *b*, ♂ ♀. Lugumbwas, Chagwe; March 1, 1898. *c*, ♂. Wakolis, Usoga; March 4, 1898.

153. *B. ZOCHALIA* (Boisd.).—*a*, *b*, ♂. Gilgil, near Lake Naivasha; September 10, 1897. *c*, ♀. Lugumbwas, Chagwe; March 1, 1898.

154. *B. LORDACA* (Walk.).—*a*, ♀. Muani, Ukambani; August 18, 1897.

155. *B. ABYSSINICA* (Lucas).—*a*, ♂. Muani, Ukambani; August 17, 1897.

156. *B. CRAWSHAYI*, *Butl.*.—*a*, ♂. Campi Rao, Nandi; March 14, 1898. *b*, *c*, ♂ ♀. Nandi; March 16, 1898.

157. *B. IANTHE* (Doubl.).—*a*. Lugumbwas, Chagwe; March 1, 1898.

158. *B. WELWITSCHI*, *Rogenh.*.—*a-c*, ♂ ♀. Campi Rao, Nandi; March 14, 1898.

159. *B. RAFFRAYI* (Oberth.).—*a*, *b*, ♂. Campi Rao, Nandi; March 13-14, 1898. *c*, ♀. Eldoma Ravine, Mau; March 20, 1898.

160. *B. THYSA* (Hopff.).—*a*, ♂.

161. *GLUTOPHRISSA FLAVIDA* (Mab.).—*a*. Misongoleni, Ukambani; August 5, 1897.

162. *G. CONTRACTA*, *Butl.*—*a*, ♂.
163. *PHRISSURA NAGARE* (*Grose Smith*).—*a*, ♀. Lugumbwas, Chagwe; March 1, 1898.
164. *ERONIA LEDA* (*Boisd.*).—*a*, ♂. Kiboko River, Ukambani; August 14, 1897.
165. *E. DILATATA*, *Butl.*—*a*. Kiboko River, Ukambani.; May 2, 1898.
166. *NEPHERONIA POPPEA* (*Donov.*).—*a-e*, ♂ ♀. Campi Rao, Nandi; March 13–15, 1898.
167. *N. THALASSINA* (*Boisd.*).—*a*, ♀. Nandi; March 16, 1898.
168. *MYLOTHRIS AGATHINA* (*Cram.*).—*a-b*, ♂ ♀. Kibwezi, Ukambani; August 10, 24, 1897. *c*, ♂. Lugumbwas, Chagwe; March 1, 1898.
169. *M. POPPEA* (*Cram.*).—*a*, ♀. Wakolis, Usoga; March 4, 1898.
170. *M. WINTONIANA*, *E. M. Sharpe*.—*a*, ♂.
171. *M. RUPPELLI* (*Koch.*).—*a*, ♂. Campi Darajani, Nandi; March 18, 1898. *b*, ♀. Campi Aziwa, Nandi; March 19, 1898.
172. *M. JACKSONI*, *E. M. Sharpe*.—*a, b*. Campi Darajani, Nandi; March 18, 1898. *c, d*. Eldoma Ravine, Mau; March 20, 1898.
173. *CATOPSILIA FLORELLA* (*Fabr.*).—*a*, ♂. Muani, Ukambani; March 17, 1897. *b, c*, ♂ ♀. Eldoma Ravine, Mau; March 23, 1898.
174. *HERPÆNIA ITERATA*, *Butl.*—*a*. Kiu Hills, Ukambani; April 19, 1898. *b, c*. Campi Mauwi, Ukambani; April 22, 1898.

Family PAPILIONIDÆ.

175. *PAPILIO MENESTHEUS*, *Drury*.—*a*. Campi Pashto, Nandi; March 15, 1898.
176. *P. MACKINNONI*, *E. M. Sharpe*.—*a*. Eldoma Ravine, Mau; March 22, 1898. *b*. Campi Darajani, Nandi; March 18, 1898.
177. *P. PRINGLEI*, *E. M. Sharpe*.—*a, b*, ♂. Eldoma Ravine, Mau; March 20–23, 1898. *c*, ♀.
178. *P. CONSTANTINUS*, *Ward*.—*a*. Kibaoni, Ukambani; April 20, 1898.
179. *P. ANTINORII*, *Oberth.*—*a*. Upper Kedong River, Kikuyu; September 4, 1897. *b*. Mondo, Chagwe; February 28, 1898.
180. *P. LURLINUS*, *Butl.*—*a*. Mondo, Chagwe; February 28, 1898. *b*.
181. *P. COLONNA*, *Ward*.—*a*. Upper Kedong River, Kikuyu; September 4, 1897. *b*.
182. *P. PHORCAS*, *Cram.*—*a*, ♂. Campi Rao, Nandi; March 14, 1898. *b*, ♂. Campi Darajani, Nandi; March 18, 1898. *c*, ♀. Mbabani, Usoga; March 4, 1898.
183. *P. SIMILIS*, *Cram.*—*a*. Lugumbwas, Chagwe; March 1, 1898.

184. *P. PYLADES*, *Fabr.*—*a, b.* Samia Hills, Kavirondo; March 7, 1898.

185. *P. NIREUS*, *Linn.*—*a.*

186. *P. BROMIUS*, *Doubl.*—*a, ♂.* Mondo, Chagwe; February 28, 1898. *b, ♀:* *c, ♂.* Campi Pashto, Nandi; March 15, 1898.

187. *P. DEMODOCUS*, *Esp.*—*a.* Kibaoni, Ukambani; April 20, 1898. *b.* Muani, Ukambani.

188. *P. JACKSONI*, *E. M. Sharpe.*—*a, b, ♂ ♀.* Campi Darajani, Nandi; March 18, 1898. *c, ♂.* Eldoma Ravine, Mau; March 20, 1898.

Family HESPERIDÆ.

189. *RHOPALOCAMPTA ANCHISES* (*Gerst.*).—*a.*

190. *PADRAONA ZENO* (*Trim.*).—*a.* Campi Pashto, Nandi; March 15, 1898. *b.* Eldoma Ravine, Mau; March 20, 1898.

191. *HESPERIA DROMUS* (*Plötz*).—*a.* Upper Kedong River, Kikuyu; September 4, 1897. *b.*

192. *CERATRICHIA FLAVA*, *Hewits.*—*a.* Campi Rao, Nandi; March 14, 1898. *b.*

193. *BAORIS ALBERTI*, *Holl.*—*a.* Campi Rao, Nandi; March 14, 1898.

194. *ACLEROS MACKENII* (*Trim.*).—*a.* Campi Darajani, Nandi; March 18, 1898. *b.* Nandi; March 16, 1898.

195. *EAGRIS* sp.—*a-b.* Nandi; March 16, 1898.

196. *SARANGESA* sp.—*a.* Eldoma Ravine, Mau; March 20, 1898.

197. *S. MOTOZI* (*Wallgr.*).—*a.* Mtoto-Ndi, Ukambani; August 4, 1897.

198. *S. SYNESTALMENUS* (*Karsch.*).—*a.* Mondo, Chagwe; February 28, 1898.

199. *CELÆNORRHINUS PROXIMUS* (*Mab.*).—*a.* Campi Rao, Nandi; March 14, 1898. *b.* Eldoma Ravine, Mau; March 20, 1898.

200. *ERETIS DJÆLÆLÆ* (*Wallgr.*).—*a, b.* Nairobi, Kikuyu; August 14, 1897.

HETEROCERA.

Family HYPSIDÆ.

201. *NYCTEMERA* sp.

202. *ARGINA CINGULIFERA* (*Walk.*).—*a.* Campi Mauwi, Ukambani; August 16, 1897.

Family ARCTIADÆ.

203. *SECUSIO PARVIPUNCTATA*, *Hamps.*—*a.* Nairobi, Kikuyu; May 24, 1897.

Family NOCTUIDÆ.

204. *CYLIGRAMMA LATONA*, *Cram.*—*a, b.* Kiu Hills, Ukambani; April 19, 1898.

205. *C. RUDILINEA*, *Walk.*—*a.*

Family AGARISTIDÆ.

206. *XANTHOSPILOPTERYX* FATIMA, Kirby. — *a.* Lugumbwas, Chagwe; March 1, 1898.

207. *ÆGOCERA* TRICOLOR, Druce. — *a.*

Family SATURNIADÆ.

208. *ANTHERÆA* ZADDACHII, Dewitz. — *a.*

Family GEOMETRIDÆ.

209. *TERINA* sp. — *a.* Campi Rao, Nandi; March 14, 1898.

210. *EUBOLIA* DISPUNCTARIA, Guén. — *a.* Muani, Ukambani; August 17, 1897.

NOTES AND OBSERVATIONS.

CONTRIBUTIONS TO THE NATIONAL COLLECTION OF BRITISH LEPIDOPTERA. — The Rev. W. Claxton, Navestock Vicarage, Romford: eight specimens of *Caradrina ambigua*, and three forms of *Anchocelis lunosa*. Mr. A. H. Clarke, 109, Warwick Road, S.W.: an example of *Cerastis erythrocephala*, taken at Marlow in October, 1859.

YELLOW COLOURING OF COCOON OF *PLUSIA MONETA*, RESULT OF MOISTURE. — On the 12th May I found a small larva of this moth on monkshood, which spun its cocoon on the 30th, this was until yesterday quite white, when I sprinkled with water the inside of the box in which I kept it and other pupæ. Some of the drops of water, I noticed, happened to fall on this cocoon. An hour or so after I was surprised to find that the *moneta* cocoon was spotted with yellow just where the drops of water had fallen. To-day I damped the whole cocoon, and turned it to a uniform yellow all over. This explains, I think, why cocoons found in a natural state on the food-plants are always yellow, as they would get moistened by rain or dew. — J. F. BIRD; The Lodge, Cowfold, Sussex, June 15th, 1903.

NOTE ON *SPILOSOMA MENDICA*. — It is not uncommon to see females of *Spiilosoma mendica* flying short distances in the hot sunshine. It appears to differ in this habit to the rest of the genus, *lubricipeda* and *menthastri* being such lethargic insects in the daytime. *Mendica* seems in this respect more to resemble *Phragmatobia fuliginosa*, which I have taken on the wing; but it must be said in either case it has always been a female specimen. I do not know if other collectors have seen males of *S. mendica*, or females of *S. lubricipeda* or *S. menthastri* flying in the daytime. — T. B. JEFFERYS; Bath, June 2nd, 1903.

MELITÆA AURINIA var. *HIBERNICA*. — With regard to Mr. Kane's mention of *Melitæa aurinia*, quoted by Mr. Freke, *ante*, p. 111, I beg to say they were reared or captured specimens from Cromlyn bog, about two miles from the town of Rathowen. Some other specimens

from the same place had been sent to Mr. Birchall, who gave them the name "*var. hibernica*," and figured them as such. A very handsome series were sent to the late Henry Doubleday, who was much delighted with the specimens, and wrote saying he had never seen their equals for size and brilliance of colouring. Unfortunately of late years *M. aurinia* seems to have quite forsaken our bog.—FRANCES J. BATTERSBY; Cromlyn, Rathowen, Co. Westmeath, May 29th, 1903.

THE NAME MICROPYGA.—I am much obliged to Mr. Cockerell for drawing my attention to the above generic name having been used previously, and I quite agree with him that such a mistake is the outcome of gross carelessness. I am, however, not quite so bad in regard of "taking not the slightest trouble," as Mr. Cockerell assumes; on the contrary, I take *every* trouble, and in this instance must have forgotten to consult the Zoological Index, although I was under the impression that I *did* consult it. As my mistake in using a generic name already employed is, I hope, the only instance during thirty years of entomological work, I trust that my crime will be included charitably under the heading of human fallibility which I have, unfortunately, in common with other authors too numerous to mention here.—M. JACOBY.

ACRONYCTA ALNI IN NORWICH.—In September, 1902, one of my cathedral choristers gave me a full-fed larva of *Acronycta alni*, which he had picked up in his garden. Its hair-like appendages were all broken off, and I found that it had an external parasite in one of the interstices of the segments. Though I believed it to be a hopeless case, I extracted the parasite with care, and laid it on some fine moistened soil in a tin box. The larva lost one large drop of green fluid, and appeared very weak. It, however, spun a little silk on the soil, and in a day or two seemed to have regained strength sufficient to turn from side to side in the accustomed manner of larvæ about to pupate. Though I still had but slender hopes of rearing it, I was pleasantly surprised in a week's time to find the skin cast, and a perfect pupa formed. This I kept through the winter in an outhouse, transferring it to the warmer climate of a kitchen cupboard at the beginning of April, 1903. The pupa was alive and well, and on May 18th it exceeded my highest aspirations by emerging into a perfectly formed full-sized male, the operation upon the larva not having impaired it in any way. The well-known frailty of larvæ in general, and the almost invariable result of a wound proving fatal, make this very interesting.—(Rev.) A. MILES Moss; June 18th, 1903.

ON REARING ENNOMOS FUSCANTARIA.—When working the electric lights for moths on the night of October 8th, 1900, I came across a battered female of the above species resting on the pavement at the foot of one of the lamps. The species is more or less common every year at Chester, and it follows the rule set by others, since the individuals attracted by the lamps are chiefly males. The female referred to was full of eggs, and consequently welcome, as I had long wished to rear the caterpillar and observe its habits. The eggs, of which there were more than a hundred, resembled miniature bricks in shape.

They were laid in irregular rows on the sides of a chip-box, with their longest sides touching each other. Their colour was a dark, almost coffee-coloured brown. Although they were kept indoors, but in a cold room without a fire, throughout the winter, hatching did not begin until May 21st of the following year. On that date a single caterpillar emerged, and nine days afterwards the rest followed suit. It appeared, even through a lens, to be nothing more than a thin greenish but very animated line. It grew apace, and kept the start it had made to the end of the chapter. It spun up on June 30th, and appeared as a fine big female on July 21st. From May 30th, hatching continued daily and gradually until June 29th, when all the larvæ had appeared. These I fed on ash leaves, always taking care that the latter were fresh. Once I tried the larvæ on birch. They ate a little, but evidently preferred ash, so I troubled them no more with experimental foods. The eggs were hatched in large glass jars placed out of the sun with pieces of muslin kept stretched over the tops by elastic bands. A piece of glass was then laid so as to almost cover the muslin, but just leaving so much uncovered as would allow for ventilation. The glass over the tops of the jars preserves the food-plant wonderfully. I may add that the larvæ were kept in these jars until they pupated. The only change I made was the substitution of net for muslin, or gauze, as the larvæ grew. After pupation the spun-up chrysalids were placed in deep card-boxes about a foot square to give the expected moths plenty of room. The caterpillar itself I found to be continuously green—head, segments, legs, and claspers—until the stage before the final one. The particular shade of green is exactly that of the ash-leaf. The protective coloration is therefore remarkable, and doubtless supplies an escape from birds as well as from the eyes of most observers. Besides, the larva rests, as a rule, on the under surfaces of the leaves, along the midribs and veins, with which it assimilates marvellously. Since ash trees are usually exposed to every wind that blows, the caterpillars are furnished with large and powerful anal claspers, enabling them to exercise a tenacious hold. They spin a silken thread which they freely use, especially in the earlier stages, as a means of locomotion. In the third stage they perhaps assimilate most with the yellowish green of the leaves, leaf-stems, and midribs, and the segmental divisions of the caterpillar are distinctly yellowish. In the fourth stage the appearance of the caterpillar is as follows: Length $1\frac{1}{4}$ inches. Hazel or hazel-green. Segment divisions russet. Head green or hazel-green. Legs and claspers dark russet. Three conspicuous dark russet warts on body—the first on segment 3; second on segment 6; third on segment 9. Although the protective coloration is to some extent lost, or perhaps it would be more accurate to say changed, at this period, it distinctly returns in the final one. The caterpillar once more assumes the green of the ash-leaf, the dark tint of the segment-divisions is gone, and that of the humps almost so. It then draws two or three leaflets together, like *Geometra papilionaria*, using a few strong, short and netted, white, silken threads. Here it changes to a pale green, stout, and anal-pointed chrysalis. I only saw one case of cannibalism. Throughout they were reared in a cool room without a fire; all had spun up by July 24th, and all had emerged by August 21st. There were a few exceptions—perhaps a

dozen. These failed to break through the silken meshes of their hammocks, and so perished. The rest were fine big healthy moths of both sexes, and most of them I let fly to join their compeers in what I have no doubt was a welcome freedom.—J. ARKLE; Chester, April.

A NEW BUTTERFLY NET.—I have recently had the pleasure of putting to practical test a very ingenious net invented and sold by Rowland Ward, Ltd., 166, Piccadilly, which collectors will find of great convenience. It forms an admirable walking-stick when not in use, which contains the ring of the net formed of two portions that can be instantly pulled out of the stick (after unscrewing the knob forming the handle), and an ordinary net-bag run on the ring-canes; the ends can then be quickly fitted together, when a small stay is slipped into place at the base, and a net of 5 ft. circumference is ready for use. The great advantage of the invention is that the collector can always carry with him a very serviceable net, which can be adjusted rapidly and as quickly put out of sight, as the modest collector does not care to brandish a large net before the gaze of the uninitiated.—F. W. FROHAWK.

FIRE IN WICKEN FEN.—We are indebted to Mr. E. G. J. Sparke for the following cutting from the 'East Anglian Daily Times' of June 10th:—"On Sunday afternoon about twenty acres of Wicken Fen were destroyed by fire, notwithstanding the efforts of a small band of the villagers to prevent the lamentable destruction of natural life. Wicken Fen, now some two hundred acres only in extent, is about the only piece of virgin fenland left in England. . . . The fire was due either to vandalism or the gross carelessness of some holiday-makers, who, in common with others of the general public, have been permitted in the past to picnic here. As a result of the damage, it is feared the fen will now be closed."

EPIDEMIC AMONG CATERPILLARS.—Mr. Littler (*ante*, p. 172) writing on an epidemic among larvæ, mentions "that possibly overcrowding is the cause"; anyhow, from my experience this does not seem to be the case. Last year (1902) I had seventeen *Melitæa aurinia*, twenty-seven *Lasiocampa quercus*, fourteen *Odonestis potatoria*, fourteen *Gastropacha quercifolia*, eleven *Notodonta trepida*, fifteen *Ptilophora plumigera*, a quantity of *Ocneria dispar*, and *Taniocampa populeti*, and others, and the results were very small, *viz.*: two *aurinia*, two *quercus*, three *potatoria*, two *quercifolia*, two *trepida*. This year I am rearing most of the same species, and in larger quantities; for instance, forty *O. potatoria* in the same cage that the fourteen were in last year; they are now nearly all full-grown, many already spun up, and this at least a month earlier than last year. In all cases I am doing vastly better up to the present, and have come to the conclusion that it must be something to do with the weather. In a bad season one has not the means of judging what the mortality is under natural conditions.—HERBERT H. CLARKE; Watlington House, Sidcup, Kent, June 3rd, 1903.

ODONATA AND ORTHOPTERA IN 1902.—Mr. Lucas found it impracticable at the commencement of the year to give his usual review of the Odonata and Orthoptera of the past season. Notes on the two seasons will, however, appear before the close of the present year.

URTICATING LARVAL HAIRS.—I read Mr. Butler's remarks on this subject (*ante*, p. 137) with special interest, as I also received a nest of *Porthesia chrysorrhæa* larvæ from our mutual friend, Mr. Hargreaves. Parenthetically I may say I planted a number of the caterpillars on a few safe hawthorn hedges, with a view to establishing the species, but the result was failure. In fact, of the many species I have tried to naturalize in the district, I can only claim to have established one—*Leucoma salicis*. With *P. chrysorrhæa* I got on very differently to Mr. Butler. I found I could handle the larvæ, and altogether exist in their company, with less irritation than with *P. auriflua*. I must confess that the larvæ of the latter smart my hands, but the irritation soon passes off. Some Chester schoolboys, however, who set up breeding-cages and started with *P. auriflua*, had a painful time of it. Next morning the head-master received letters of apology for their absence, saying that all the lads were suffering from a painful affection of the eyes. Of the species mentioned by Mr. Carter (*ante*, p. 68), I can handle the caterpillars of *Arctia caia*, *A. villica*, *Malacosoma (Bombyx) neustria*, *Callimorpha dominula*, *Gastropacha (Lasiocampa) quercifolia*, *Saturnia carpini*, *Orgyia antiqua*, *Dasychira pudibunda*, *Lasiocampa (Bombyx) quercus*, and *Macrothylacia (Bombyx) rubi* without irritation, but the cocoons of the last two set up a smarting which is nothing else than painful. I agree with Mr. Carter that a good deal of explanation may be found in a susceptible cuticle. The cases may hardly be on all fours, but (1) I once came across a boy coolly gathering young nettles, with his bare hands, to boil as a vegetable, and (2) a friend of mine had his hand much inflamed and swollen through inadvertently placing it on a young growth of the same kind of inland nettles. The susceptible cuticle doubtless explains much, but the history of poisons, as applied to the animal world, seems to point to something else that is constitutional. For instance, I have just been told of a patient who was so distressed by a sixth of a usual dose of strychnine, administered medicinally, that the treatment had to be changed.—J. ARKLE; Chester.

ACHERONTIA ATROPOS IN APRIL.—On the 8th instant one of these moths was brought to me. It was found at five p.m. at rest on board His Majesty's coastguard cruiser 'Rose,' at sea, in the North Sea, off Southwold, on April 28th, so it probably flew on board the previous night. The weather during the night had been fine and warm, with a light breeze from the south-west, and the ship was cruising from five to ten miles off the land. When I received the moth it was transfixed with a large threaded needle to a small piece of soft wood, and the thread was wound round and round the wings and body and the piece of wood, so that the insect could not possibly move. Chloroform had been administered several times, but it was still alive, so I cut the threads and killed the poor creature with oxalic acid. Notwithstanding the rough treatment it had received it was in very fair condition, and had apparently not been long from the pupa. This is an interesting capture, for it shows how early the species emerges in a state of nature. I have taken the full-grown larvæ at the beginning of July which must have been produced from ova deposited early in May.—GERVASE F. MATHEW; Dovercourt, May 19th, 1903.

CAPTURES AND FIELD REPORTS.

ACHERONTIA ATROPOS IN SALTAIRE.—On May 15th I had a specimen of *A. atropos* brought to me by a friend, he having taken it in a street in Saltaire.—SAM HAINSWORTH; 14, Dove Street, Saltaire.

NOTES ON PLUSIA MONETA, &c.—For the third year in succession, including this season, I have successfully reared large numbers of this species, to the advantage of numerous correspondents and, of course, my own collection. They have all been taken within a mile or so of this neighbourhood, and mostly in cottage gardens. The best time to secure the larvæ is in the early spring, immediately its food-plant begins to show through; and I have found that the easiest way to rear them is to place the larvæ on growing plants in the garden and leave them alone, but it is necessary to protect them from birds—ichneumonidæ they rarely are—and in order to do this I procure a cheese-box, knock the bottom out, fit a “sleeve” of muslin or leno to the remaining sides, and place it over the plant, embedding the round box-sides into the earth, push a long stick into the centre of the plant, place the larvæ on same, bunch the material round the cane above them, and tie with tape. The whole thing then has the appearance of a miniature tent. I might add, *en passant*, that many other low-feeding larvæ can be successfully reared in this manner, especially *Apamea ophiogramma*. While *P. moneta* is getting more plentiful, I notice that *P. chrysitis* is becoming scarcer. I have not taken one for three years now, near London; indeed, I have not even seen one in the wild state alive during that time, and I know of other collectors who have noted the same thing. Why is this, I wonder? It was formerly very common everywhere. In conclusion, I should just like to warn rearers of *P. moneta* that the house sparrow looks upon the larvæ and pupæ as a great delicacy; I noticed quite a dozen of these mischievous little scavengers, twittering and dodging in and out of a large plant of *Aconitum* last week. Being suspicious of their doings, I got permission from the owner of the garden, and overhauled the plant to find the cause of the excitement, and, lo! cocoons of *P. moneta*, literally torn from the leaves and the pupæ extracted, some of which were lying on the ground in a very mutilated condition. A great number, I have no doubt, perish in this way.—A. J. LAWRENCE; 76, Samos Road, Anerley, S.E.

DIPTERA, COLEOPTERA, &c., AT HASTINGS.—At Whitsuntide I spent seven days at Hastings, and took the opportunity of collecting what few Diptera the rain had not washed away; but the effect of the continual rains was painfully apparent, and though species were proportionately numerous, examples were the reverse. Most of my collection being packed away, I could only identify some of my captures. I worked Ecclesbourne Glen three times for about three hours on each occasion, and once collected on the outskirts of the town. Amongst the higher Diptera I took four *Dioctria rufipes*, two *Chlorosia formosa*, a *Hilara* and an *Empis*, an *Argyra*, and two or three other Dolichopods. In Syrphidæ I took a small series of *Syrphus tricinctus* (females only), *S. luniger* (three), showing both the orange and bright yellow forms; *S. ribesii*, rather commonly in both sexes, from which species I have

not yet differentiated *vitripennis*, though Mr. Verrall says the two species are distinct; one female, however, exactly answers to Mr. Verrall's *vitripennis*. Of *S. nitidicollis*, an uncommon species, I took a perfect female on the outskirts, and of *albostrigatus* and *cinctellus*, one female each. Also present were *Chilosia* (three or four species, at least), *Pipiza noctiluca*, female, and *Platychinus scutatus*, male. A pair of *Xylota segnis*, a male *Brachyopa bicolor*, a male *Xanthogramma citrofasciatum*, all from the Glen. Six specimens of *Baccha*, of which three answer to *obscuripennis* and three to *elongata*, tested by the wing coloration, but I cannot separate them in accordance with the specific character of the dusted face. A few specimens of a *Pipiza*, &c., a *Chrysogaster*, five or six species of Tachinidæ, two of *Sarcophaga* (one with red-tipped abdomen), a *Graphomyia maculata*, female; *Poliates lardaria* and *P. albolineata*, both rather common, with at least a dozen other species of Anthomyidæ, apart from those that are ubiquitous; *Myodina vibrans*, *Sapromyza* (three species), *Scatophaga* (three species), *Spilograpta zoe*, and another Trypetid. In *Nemocera*, a small series, including both sexes, of *Ptychoptera contaminata*, in a ditch and pool at the extreme land end of the Glen, *Pachyrina* sp. (? *pratensis*), male and female in cop., *Tipula* (? *vernalis*), and another species of the genus, besides about a dozen species of Limnobiinæ, the latter taken on a dull damp day around the spring in Ecclesbourne Glen, and in company with several species of *Mycetophilidæ* and *Chironomidæ*.

In Coleoptera, *Coccinella bipunctata* was common in cop. on bushes in the sunshine. I saw one 7-punctata, but it escaped me, and I took two or three other species, unless they are vars. of *variabilis*; two species of *Telephorus*, a small livid one, and (I think) *pellucidus*; several of the smaller and commoner beetles, and a *Clytus arietis*, which, reviving from the sulphur fumes after being impaled, lived thus for several days. A monster brown and yellow dragonfly fell a prey either to curiosity or bravado, as, after missing it the first time (due to it settling on the top of a high bush covered with brambles in Ecclesbourne Glen), it hovered just above the same spot, and I took it with a return stroke of the net. I captured also two much smaller dragonflies, and saw a species of *Æschna*, flying too high to reach it. One or two species of *Nomada*, a large female *Bombus lapidarius*, two or three Chrysidæ, several Tenthredinidæ, and a number of a rather large black ant on a dead tree stump, represented the Hymenoptera, and in Lepidoptera I only saw the common white, common blue, and small heath, and only one or two of each.

In fine weather, a week or fortnight in this locality ought to result in a rich harvest. Ecclesbourne Glen must possess an extensive fauna in at least Diptera, and though I did not visit the sister glen (Fairlight), it ought, I think, to be about equally productive.—E. BRUNETTI; 103, Brixton Road, S.W.

NOTES FROM NEW ZEALAND.—I arrived here October 2nd, 1902, but except a few hibernated *Vanessa gonerilla*, which greatly resembles English *V. atalanta*, and feeds on nettle, and of which I subsequently bred a nice series, there was nothing about until the end of the month, when at light I obtained several examples of the magnificent green *Hepialus virescens*. The season was very wet and cold, and there were

no butterflies about until the middle of December, when the two coppers, *Chrysophanus salustius* and *C. enysii*, were very abundant in the clearings in the bush. By far the rarest and one of the most striking of the New Zealand butterflies is *Dodonidea helmsi*, and Mr. G. V. Hudson having kindly told me of its locality, I went in search of it on February 15th. The day was very hot, and after leaving the railway there was a climb of three miles to the top of the hill; however, the sight of a splendid specimen flying across the road and then returning to the bush was great encouragement. At the top a small watercourse led into the dense bush, which here consisted of tall trees (birch), and, very unusual for New Zealand, very little undergrowth, and here, in the darkest part of the forest, there were several specimens about, but, owing to the rough nature of the ground (fallen trees, tussock grass, and marsh), I was unable to catch any specimens. Pushing on through the forest, I presently came to another clearing, and here there were several *D. helmsi*, sailing about like our *Limenitis sibylla*, and coming out of the dark forest, hovering over a sunlit leaf, and then returning into the darkness again, but almost always through the same opening. Standing beside this, on a small mound, I succeeded in obtaining fourteen specimens. It was a splendid day's work, and most exciting, for, although a slow flyer, the insect is difficult to catch, and, added to that, frequent falls occur owing to the roughness of the ground. I may add that when settled, as it frequently does in the sunshine, on the midrib of a leaf, it is most difficult to see, owing to the peculiar colour and marking of the under side. The ground is very hilly here, and at one place, standing on top of a hill, I was level with the tops of the trees only a few yards away, and around which were several *D. helmsi* sunning themselves. On February 22nd I obtained an example of *Lycana phæbe*, and later saw another, and in March I got a few *V. gonerilla*, but about this time a sharp attack of pneumonia put a stop to collecting. In Heterocera I got two examples of *Declana atronivea*, a very handsome insect, with silver and black upper wings and smoky grey under wings. The only other things worth mentioning were our old friends *Agrotis ypsilon* and *Heliothis armigera*, a single example of each.—HUBERT W. SIMMONDS; 23, Hill St., Wellington, N. Z., April 13th, 1903.

LEPIDOPTERA AT LIGHT DURING APRIL AND MAY, 1903.—It may be of interest to record my captures at the gas-lamps in Dorking up to the end of May. I have worked fairly regularly, and sometimes as late as 1 a.m., the best times being between 11 p.m. and 1 a.m. I append the date on which each species was taken for the first time:—*Smerinthus ocellatus*, May 27th. *Euchelia jacobææ*, May 25th. *Spilosoma lubricipeda*, May 24th. *S. menthastri*, May 10th. *Dasychira pudibunda*, May 28th. *Pterostoma palpina*, May 23rd. *Lophopteryx carmelita*, May 1st. *Notodonta dictæa*, May 28th. *N. dictæoides*, May 31st. *N. trepida* May 31st. *N. trimacula (dodonea)*, May 23rd. *Grammia trigrammica*, May 31st. *Agrotis puta*, May 18th. *A. cinerea*, May 28th. *Pachnobia rubricosa*, May 8th. *Teniocampa gothica*, April 27th (taken also in March). *Rumia luteolata*, May 18th. *Selenia bilunaria*, May 8th (taken also in March). *S. lunaria*, May 28th. *Odontopera bidentata*, May 18th. *Tephrosia crepuscularia*, May 10th. *Strenia clathrata*, May 28th. *Panagra petraria*, May 20th. *Ligdia*

adustata, May 21st. *Eupithecia oblongata*, May 18th. *E. vulgata*, May 22nd. *E. exigua*, May 31st. *E. pumilata*, May 23rd. *Lophophora viretata*, May 29th. *Melanippe fluctuata*, May 4th. *Coremia unidentaria*, May 10th. *Phibalapteryx vitalbata*, May 8th. *Eucosmia certata*, May 14th. *Anaitis plagiata*, May 4th.—(Rev.) F. A. OLDAKER; Parsonage House, Dorking, June 10th, 1903.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON. — May 6th, 1903. — Professor E. B. Poulton, M.A., D.Sc., F.R.S., President, in the chair. The President exhibited one of the original invitations to join the Society issued in 1834, and signed "G. R. Gray, Secretary *pro. tem.*" Mr. Willoughby Gardner exhibited nest-cells of *Osmia xanthomelana* from Conway, North Wales. He said the species, one of our rarer mason bees, places its beautifully constructed pitcher-shaped cells at the roots of grass, usually four or five together. There is no previous record of the nest having been found since Mr. Waterhouse discovered and described it from Liverpool about sixty-five years ago. Mr. M. Jacoby exhibited *Arsoa longimana*, Fairm., and *A. aranea*, from Madagascar, the only other specimens of these species he knew of being in the British Museum collection. He also exhibited *Megalopus melipona*, Bates, and *M. pilipes* from the Amazon, which bore a remarkable resemblance to a bee. Mr. A. J. Chitty exhibited a water-beetle new to Britain, viz. *Hydroporus bilineatus*, Sturm., discovered by Mr. Edward Waterhouse among some specimens of *Hydroporus* given by Mr. Chitty to him as *H. granularis*. The specimens were taken at Deal in 1891, and probably all records of *granularis* from Deal relate to this species. He also exhibited a specimen of the rare *Trechus rivularis* (*incilis* of Dawson), taken at Wicken Fen in August, 1900. Mr. O. E. Janson exhibited specimens of *Neophædimus melaleucus*, Fairm., a goliath beetle from Upper Tonkin, and remarked that the white colouring was derived from a dense clothing of peculiar semi-transparent coarse scales which were apparently easily removed by abrasion, and seemed to partake of the nature of the "fugitive" scales found upon freshly-emerged specimens of *Hemaris* and other Lepidoptera. The President read a communication from Mr. G. F. Leigh, on "Protective Resemblance and other Modes of Defence adopted by the Larvæ and Pupæ of Natal Lepidoptera," and exhibited cocoons of *Eublemmistis chlorozonea* to illustrate some of his remarks. He said that it was of great interest to hear the conclusions, as to the general meaning of the colouring of Natal larvæ, reached by one of their Fellows who had so wide and intimate an experience as Mr. Leigh. It was interesting to observe that Mr. Leigh considers the larva of *Papilio nireus* to be conspicuous, when its pupa possesses a wonderful power of colour adjustment, as was first shown and figured by Mrs. M. E. Barker in the Transactions (1874, p. 519). The first account of the larvæ and pupæ of *Papilio dardanus* was given by Mr. Mansel Weale (Trans. Ent. Soc. Lond. 1874, p. 131). The combination of many larvæ to produce a patch of colour like the bark on which they

rest is very interesting, as also is the "homing" instinct which leads the larvæ to return to the same spot at the end of each night. Prof. Poulton also showed a specimen of *Polygonia c-album* in the attitude of prolonged repose, together with specimens of *Anæa moeris* set in different ways to illustrate its probable resting position. He said that the "C" or "comma" on the under surface of the hind wings in butterflies belonging to the genus *Polygonia* (*Grapta*) no doubt represents in bright, strongly-reflecting "body-colour" the light shining through a semicircular rent in a fragment of dead leaf—the rent produced when a little segment of leaf has broken away along a curved line, but still remains connected with the rest—across the chord of the arc. The President also exhibited a pair of *Hypolimnas misippus* taken *in coitu* by Mr. Horace A. Byatt, near his house, at a height of 4500 to 5000 ft., in Dedza, Central Angoniland, British Central Africa. The specimens were remarkable in that the female was excessively worn and old, far more so than the male. Such an observation tends towards the conclusion that pairing occurs more than once in the life of an individual of this species. Mr. G. A. J. Rothney communicated "Descriptions of Twelve New Genera and Species of *Ichneumonidæ*, and Three New Species of *Ampulex* from India, by Peter Cameron." — H. ROWLAND BROWN, *Hon. Sec.*

SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—*April 9th, 1903.*—Mr. E. Step, F.L.S., President, in the chair.—Mr. R. Adkin exhibited a short series of *Phigalia pedaria*, bred from York larvæ, and remarked particularly on the intensely black coloration which has been developed in both sexes.—Mr. Turner, an example of the var. *trapezaria* of *Crocallis elingvaria* from Brockley, and pointed out the very dark central band, its distinguishing character. He also showed a short series of *Cleora glabraria* from the New Forest, and remarked that the species had recently been taken in North Devon by Mr Tunaley.

April 23rd.—The President in the chair.—Mr. Harrison and Mr. Main exhibited a long bred series of *Teniocampa munda*, from ova laid by two females captured in 1902 in Epping Forest. The series exhibited all the forms of the ground colour, from var. *pallida* and var. *grisea* to an extreme form of var. *rufa*. Many were sprinkled with dark scales as in *T. pulverulenta*. Most of the specimens were of the var. *geminatus* with six well-developed black spots in the submarginal line.—Mr. Turner, (1) specimens of *Blabophanes imella* and *Litha athiops* from Bonhill, Dumbartonshire; (2) a series of *Sitones griseus* taken on broom at Horsall Common by Mr. Kemp and himself; (3) living larvæ and cases of the following Coleophorids:—*C. genistæ* from Loughton, *C. cæspititiella* from Loughton, *C. pyrrhulipennella* from Woking, *C. albittarsella* from Ashtead, and *C. auricella* from Locarno, the last-named sent by Dr. Chapman.—Mr. Goulton, a variety of *Noctua festiva* with the external half of the wing beyond the stigmata of a very deep chestnut-brown; and a variety of *Plusia gamma* having various red markings and darkenings, forming var. *rufescens*.—Mr. West (Greenwich), specimens of three species of Hemiptera from Box Hill, *Corimelæna scarabæoides*, *Tropidostethus holosericeus* and *Tettigometra impressopunctata*.—Mr. Carr, living larvæ and cases of a Psychid, *Bacotia sepium*, beaten

from fir in the New Forest.—Mr. Step, living specimens of the Coleopteron *Anthrenus musæorum*.—The Secretary had heard from various members who were spending Easter on the Continent. Dr. Chapman had stated that at Locarno the weather was cold, but some twenty species of butterflies were observed on April 20th. Mr. Sich had noted *Papilio podalirius* as common near Lake Como. Mr. Tutt had had very fine weather at Hyères. Mr. Cant and Mr. McArthur reported having seen a furze-chat hawking very successfully for *Brephos parthenias*.

May 14th. — The President in the chair.—Mr. Shakespeare, of Kingston-on-Thames, was elected a member.—Dr. Chapman exhibited a pair of *Graellsia isabellæ* bred from larvæ found at Bronchaes in 1901; a specimen of bark, from the Italian Riviera, closely set with the helix-like cases of the Psychid *Apterona crenulella*, which was locally abundant in 1902.—Mr. Carr, larvæ of *Ellopiæ prosapiaria* (*fasciaria*) and *Bryophila perla*, from the New Forest.—Mr. Step, photographs of *Panolis piniperda* and *Tephrosia punctularia*, in their position of rest on tree-trunks.—Mr. West (Greenwich), three species of somewhat uncommon Staphylinidæ: *Mycetoporus angularis*, among dried leaves at Shirley; *M. nanus*, in moss, at Box Hill; and *Pseudopsis sulcata*, in decayed vegetable matter at Oxshott.—Mr. Kirkaldy made remarks on the maternal solicitude of female insects for their young, and asked members to make observations on the subject during the present season.—Mr. Turner called attention to an instance of birds attacking butterflies, and asked the members to furnish the Society with details of any cases which came under their notice. It was suggested that members who were making photographs of scientific objects should give the Society a print, so that an album could be arranged to illustrate some line of study. The ova of the Lepidoptera were very little known, and might form a good subject for investigation.

May 28th.—The President in the chair.—Mr. Lister, of Easty, Kent, was elected a member.—Dr. Chapman exhibited a female of *Euchlœa euphenoides* from Cannes, measuring 48 mm. in expanse, 30–42 mm. being the usual range.—Mr. Turner, living larvæ and cases of the following species of the genus *Coleophora*, and gave notes on their habits and occurrence:—*C. artemisiella*, *C. maritima*, *C. nigricella*, *C. anatipennella*, *C. bicolorella*, *C. ibipennella*, and *C. hemerobiella*. He had found a larva of *C. nigricella* on *Smyrniolum olusatrum* at Benfleet. At the last-named place he had found a solitary larva of *Phorodesma smaragdaria*, and thought that the species would probably be exterminated by the destruction of its food-plant in the extensive repairing of the sea-walls.—Mr. Goulton, an example of the coleopteron *Phytodecta viminalis* from Ranmore; it was stated to be common at Oxshott.—Mr. West, photographs taken during the Society's field-meeting at Box Hill.—Mr. Step, photographs, taken at the same meeting, of *Eupithecia exiguata* and *Melanippe fluctuata*, showing their resting positions on palings.—Mr. Chapman noted that the latter species usually had its head close to the next paling, and the body nearly horizontal.—Mr. Step read the report of the field-meeting at Box Hill on May 16th, 1903.—HY. TURNER, *Hon. Report. Sec.*

BIRMINGHAM ENTOMOLOGICAL SOCIETY.—April 20th, 1903.—Mr. G. T. Bethune-Baker, President, in the chair.—Mr. A. H. Martineau ex-

hibited *Xylocopa flavo-rufa* and a species of *Anthia* taken by a friend near to Bloemfontein.—Mr. G. W. Wynn, a small series of *Lithosia caniola*, taken at sugar near Torcross, South Devon; and also two *Agrotis obelisca* from the same place, taken in August last year; also *Euchloris* (*Phorodesma*) *pustulata* (*bajularia*) from Knowle, and *Melitæa aurinia*, taken by himself at Sutton Park in 1884, and probably the last specimen of the species taken so near to Birmingham. Mr. Fountain said that the last-named species was taken much more recently at Knowle, which, however, is not quite so near to Birmingham as Sutton. Mr. Fountain showed a series of *Biston strataria* (*prodromaria*) reared from a pair taken in *cop.* at Chelmsley Wood last year; he found that the best way to rear them without cripples was to cover them with moss and keep it wringing wet; on former occasions, when rearing the species, he had always had a large proportion of cripples. Mr. Bethune-Baker expressed surprise at this, as he reared a large brood once, and had no trouble with cripples; but Messrs. Wynn and Wainwright said that in their experience cripples were very frequent, not only in breeding-cages, but also in a state of nature. They found more crippled than perfect, even in the woods. Mr. Fountain also showed *Tæniocampa gracilis*, bred from Earlswood larvæ.—Mr. G. T. Bethune-Baker exhibited a boxful of African Lycenidæ, conspicuous by the absence of the normal blue colours; they were all from Sierra Leone, and included *Liptena acraea*, which resembled an *Acræa*.—COLBRAN J. WAINWRIGHT, *Hon. Sec.*

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY. — *April 20th, 1903.*—Mr. Richard Wilding in the chair.—The Secretary announced the following donations to the Library:—‘The Flora of the Liverpool District’ (with eight hundred drawings of the plants by Miss E. M. Wood, and twenty-one photographs of the neighbourhood by Dr. J. W. Ellis, F.E.S.) edited by Dr. C. Theodore Green, F.L.S., presented by Dr. Ellis; and ‘Notes on the Large Copper (*Chrysophanus dispar*)’, by J. R. Charnley, F.Z.S., F.E.S., from the author. Mr. William Webster, M.R.S.A.I., Vice-President, communicated a valuable paper on “Entomological Antiquities and Folklore of Insects,” in which he dealt in an interesting and exhaustive manner with a large number of the quaint sayings and superstitions that have from time immemorial been associated with many of our better known hexapods. The period covered extended from the earliest times to the present day, and was conveniently considered under headings of the various orders of insects as at present constituted. A hearty vote of thanks having been accorded the lecturer, the following exhibits were shown:—A specimen of the exceedingly rare lepidopteron *Leucania flavicolor*, with *L. pallens* and *L. straminea*, by Mr. F. N. Pierce; *Hydrophilus piceus* from Wicken Fen, October, 1902, by Mr. F. Birch; *Attacus cynthia*, *A. atlas*, *A. promethea*, &c., reared from foreign pupæ, by Mr. J. J. Richardson; *Periplaneta americana* from Manchester, February, 1903, by the Secretary, on behalf of Mr. Ben. Jones; British Coleoptera, including *Harpalus neglectus*, *Bembidium clarki*, *Ammæcius brevis*, &c., from Birkdale; *Aphodius sordidus* (Blackpool) and *Bembidium argenteolum* (Lough Neagh), by Mr. R. Wilding; and a collection of British Dermaptera by Mr. E. J. B. Sopp.—E. J. BURGESS SOPP, *Hon. Secretary.*

RECENT LITERATURE.

The Metamorphosis of Sisyr. By MAUDE H. ANTHONY. ['The American Naturalist,' August, 1902.] Ginn & Co., Boston, U.S.A.

In this excellent paper Miss Anthony has given an exhaustive life-history of *Sisyr umbrata*, Needham, a member of a somewhat obscure genus belonging to the fam. Hemerobiidæ, of the sub-order Planipennia, of the Linnæan order Neuroptera. The larvæ of one of the British species of the genus have been found abundantly living in freshwater sponge (*Spongilla fluviatilis*). Miss Anthony finds that a freshwater sponge is the food of *S. umbrata*, and she says that "the food so obtained is so pure as to be wholly absorbed, leaving no residuum." We are not, therefore, surprised to hear that at least one-fourth of the posterior part of the stomach is atrophied, and that there is no opening at that end. The larva is a silk-spinner, and "it seems probable that the nitrogen waste of the body is used, partially at least, in the manufacture of silk." In Britain we have three well distinguished species of the genus—*S. fuscata*, *S. terminalis*, and *S. dalii*. It is to be presumed that the life-history of these differs but little from that of *S. umbrata*, and students of our Planipennia will therefore find this paper with its eighteen excellent figures of great use.

W. J. L.

The Butterflies and Moths of Europe. By W. F. KIRBY, F.L.S., F.E.S., &c. Pp. i-lxxii, 1-426. Plates, 54 coloured and 1 plain, with many illustrations in the text. London: Cassell & Co., Ltd. 1903.

A REVISED and extended edition of Mr. Kirby's well-known book, which was first produced by Messrs. Cassell in 1882. Since that date many species have been added to the list of European Lepidoptera, and most of these—all, in fact, as regards butterflies and the larger moths—have been included in the present volume. Species or forms of European species peculiar to Madeira and the Canary Islands are also referred to.

Arrangement and nomenclature remain pretty much as they were in the first edition, and synonymy is only used where necessary to avoid confusion.

In the earlier edition there were sixty-two plates, but on the fifty-four in the present issue room has been found not only for all the species previously figured, but for important additions thereto. These figures are exceedingly accurate, and will be of the greatest assistance to all who may consult the work for the purpose of identifying their captures, more especially, perhaps, among British "Macros."

Two plates are devoted to a selection of figures representing some prominent species belonging to the different families embraced in the "Micros." It is to be hoped that Mr. Kirby may be able to give us a volume, on the plan of that now under notice, dealing entirely with these sadly neglected groups of highly interesting moths. We feel confident that it only requires the stimulus of such a book to awaken a large amount of interest in the Micro-Lepidoptera of this country.

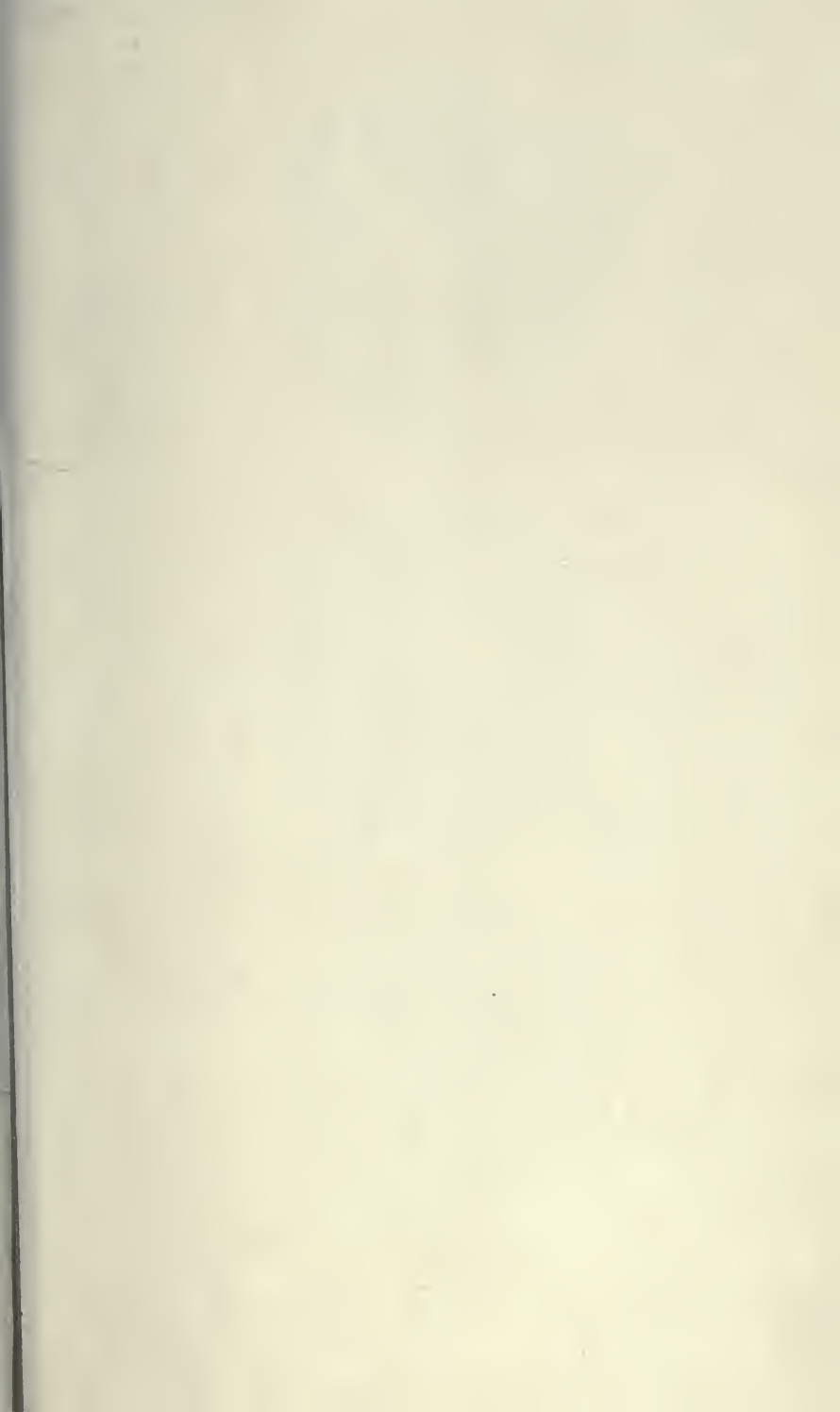




Fig. 1.



Fig. 2.



Fig. 3.

PLUSIA MONETA.

1. Larva.

2. Cocoon.

3. Imago.

(From photographs taken by H. W. Shephard-Walwyn, F.Z.S., F.E.S.)

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PLUSIA MONETA.

By H. W. SHEPHEARD-WALWYN, F.Z.S., F.E.S.

(PLATE III.)

My annual visit to Bidborough in search of *Plusia moneta* resulted in the discovery of nineteen cocoons and two larvæ. The species appears to be more plentiful this season, as I only managed to obtain six cocoons last year, after about three hours' search. The resting position of the perfect insect is most striking (Plate III., fig. 3), as it hangs by its two front legs, stretching them out to their fullest extent, in which attitude it gives the impression of trying to push the stalk away from it.

I enclose photographs of a larva and a cocoon, as well as one of the perfect insect.

Dalwhinnie, Kenley, Surrey.

URTICATING LARVAL HAIRS.

By E. A. COCKAYNE.

MUCH interested in the discussion about the irritating effects of larval hairs, I have recently examined all the British species I could procure. The commonest type of hair appears to be that in which the central shaft bears spines directed away from the base. They vary in length, thickness, and in the number and shape of the spines. Hairs of this nature are possessed by *Porthesia auriflua*, *P. chrysorrhœa*, *Spilosoma menthastri*, *S. lubricipeda*, *S. mendica*, *Nemeophila plantaginis*, *Euthemonia russula*, *Phragmatobia fuliginosa*, *Dasychira pudibunda*, *D. fascelina*, *Orgyia antiqua*, *Psilura monacha*, *Acronycta menyanthidis*, and *A. myricæ*.

In the case of the last three they are very slender, and probably would not penetrate the skin. The short hairs behind the hump in *Acronycta tridens* are similar, but the long hairs in this species, and in *A. psi* and *A. rumicis*, are quite smooth. Apparently, in the case of *D. pudibunda*, it is the tussock hairs which are most harmful. These are very sharp and stiff, with extremely long spines closely set. *Orgyia antiqua* possesses similar spines, but they appear less strong, and probably their absence of effect on Mr. Carter is due to this. In *D. fascelina* the spines are much longer, but appear thinner, and stand out more from the shaft.

The hairs in *Arctia caia*, *A. villica*, *Acronycta aceris*, and *Malacosoma neustria* are alike in possessing a small swelling just before the hair terminates in its sharp point. In the first three there are small sharp spines directed forwards. *M. neustria*, however, has a very few minute spines with wide bases directed at right angles to the shaft. In all these insects, if the hair punctured and broke off, it would with difficulty be extracted, but they do not appear to possess much penetrating power.

Most interesting, however, were the hairs of *Porthesia auriflua*. I shook a cocoon of this species on to a slide, and found numbers of extremely minute hairs. They were very fine and short, and under a high power of the microscope showed very close set lines of backwardly directed short spines or barbs. The base in all cases terminated in two larger divergent curved spines. In the larva these hairs exist in a thick tuft on the fifth segment, and are easily pulled out. Apparently the evil effects of *P. auriflua* are due to these, and not to the long hairs. I could only obtain one cocoon of *P. chrysorrhœa*, and this appeared almost free from hairs, the few present being typical long spiny ones.

The long hairs in *Lasiocampa quercus*, *L. rubi*, and *Odonestis potatoria* are quite smooth. The small hairs, however, though appearing smooth under low power, were found to be studded with rows of minute backwardly directed spines. In the cocoon these stand out, and with their stiffness and sharp point readily penetrate the finger. Though all these hairs are apparently hollow, they are generally full of air-bubbles, and there is no visible exit for any poison which might be secreted. Since they are equally virulent in the cocoon, this explanation of their action seems unlikely to be correct. And though the different effects of the hairs on Mr. Carter and others seem to point to a specific poisonous action, the hairs are chitinous, and chitin is a harmless body.

The rapidity of the action, also, is difficult to explain on any other grounds. The larvæ possessing smooth hairs, such as some *Acronyctas*, *Leucoma salicis*, *Saturnia carpini*, and *Pecilocampa populi* appear to be harmless to any skin, however susceptible. In the spiny haired larvæ the detachability of the

hairs must be an important factor, but, on the whole, those with strongest and sharpest spines seem to be most active. If the result be due simply to the hair penetrating the skin and then working into the deeper layers and setting up irritation there, hairs of *Acronycta aceris* should have similar effect to those of *Arctia caia*. Unfortunately my own skin is not sufficiently susceptible to test this point. The only hairs which have any effect on me are those of *Lasiocampa quercus*, *L. rubi*, and *O. potatoaria*, which certainly act by piercing the skin and working in by means of the barbs. Irritation is slow in coming on, but lumps are raised which do not disappear for nearly a fortnight.

If, however, the symptoms are not due to purely mechanical causes, it certainly seems curious that the degree of virulence so closely corresponds with what would be expected from their structure.

THE SPECIFIC IDENTITY OF *LUCINIA TORREBIA*, MÉN.

By PERCY I. LATHY, F.Z.S., F.E.S.

KIRBY, in his 'Synonymic Catalogue of Diurnal Lepidoptera,' p. 218, gives Haiti as the locality of *Lucinia sida*, Hübn., and places *L. torrebica*, Mén., as a synonym of Hübner's species.

I find, however, that specimens from Cuba agree with Hübner's figures of *L. sida*, and that the *Lucinia* from Haiti, which was described by Ménétries, Bull. Mosc. 1832, p. 310, n. 37, is distinct from the Cuban form, consequently the name *torrebica* will stand for the Haitian *Lucinia*.

L. torrebica may be separated from *L. sida* by the following characters:—The irregular median black band of the fore wing above is only slightly broken, in *L. sida* the break is the width of the space between middle and lower median nervules; the black band from costa to outer margin is very wide where it joins margin, in *L. sida* it is extremely narrow; the antemedial brown band of the hind wing below is more irregular, and the white area more extended; but it is in the metallic blue-green spots of the hind wing below that the chief difference is exhibited; in *L. torrebica* the upper series is composed of three almost equal sized spots, with occasionally a fourth minute one; in *L. sida* the central spot is very much larger than the others, and the spots of the lower series are considerably larger than the corresponding ones in *L. torrebica*.

ON SOME GEOMETRIDES COLLECTED BY PAYMASTER-
IN-CHIEF GERVASE F. MATHEW, R.N., ON THE
MEDITERRANEAN, &c.

By LOUIS B. PROUT, F.E.S.

My kind correspondent, Mr. Gervase F. Mathew, having most generously enriched my collection with a number of interesting Geometrides collected by himself at various times in the above-named (to us not too well known) region, I have thought it would be of interest to publish a note on them in the pages of the 'Entomologist'; the more so as at least one of the records is faunistically new, while I strongly suspect several of the others to be so likewise. I shall arrange the species according to their localities, making notes on the forms where needful.

VIGO (July, 1886).—*Acidalia ochrata*, Scop., male; *A. interjectaria*, Bdv. (*fuscovenosa*, Goeze), dark; *Rhodostrophia vibicaria*, Cl., three males, all of the frequent southern aberration *strigata*, Stgr., one female of the (more beautiful) type form, with broad rosy band,—all four specimens rather small compared with those which I have from Cuenca, Tragacete, and Piedrahita; *Pseudoterpna coronillaria*, Hb., two; *Ematurga atomaria*, L., a large male with the ground colour bright, and the markings strong; *Rhoptria* (*Gnophos*!, Stgr. Cat.) *asperaria*, Hb., one example, belonging to the unicolorous ab. *pityata*, Rbr.

LISBON.—*Acidalia nexata*, Hb., and *Larentia malvata*, Rbr., one of each; neither is included in Santos' (very meagre) Lisbon list (Jorn. Acad. Sci. Lisbon, tom. x.), but *A. nexata* is recorded as Portuguese in Staudinger's 'Catalog,' and our national collection has some nice Lisbon examples collected by Eaton.

GIBRALTAR.—*Thamnonoma spodiaria*, Lef. = *semicanaria*, Frr., Stgr. Cat., one specimen.

NICE (April, 1897). — *Camptogramma bilineata*, L., a rather large specimen, glossy, and of a peculiar tint, the dark lines faint; *Minoa murinata*, Scop., two, both of the typical brown-grey continental form;* *Larentia riguata*, Hb., two, rather strongly marked.

ALGHERO, SARDINIA.—*Acidalia imitaria*, Hb., a rather small male, May 27th, 1898.

MALTA.—*Larentia fluctuata*, female, dated March 3rd, 1897; an extremely interesting aberration, the markings being all excessively weak, notwithstanding that the specimen is in immaculately perfect condition; *Eupithecia pumilata*, Hb., two, bred in January, 1898; *Rhodometra* (*Sterrha*, H.-S., nec Hb.) *sacraria*, L., a good male, April 19th, 1898; *Acidalia virgularia*, Hb., male, pale form (= var. *australis*, Z.), May, 1898 (is this not rather early for "gen. æst."?); *Aspilates ochrearia*, Rossi, male; *Anaitis plagiata*, L., three, one (March, 1897) being of medium size, the other two (October, 1897, and May, 1898)

* Our British forms, though varying locally, are almost all intermediate between this type and the ochraceous var. *monochroaria*, H.-S., and probably deserve a varietal name.

small, so that the size is hardly correlated with the epoch of appearance.

ANCONA (Aug. 25th, 1897).—*Acidalia rubiginata*, Hfn., *A. subsericeata*, Hw., and *A. emutaria*, Hb. (small); one specimen of each.

TRIESTE.—*Minoa murinata*, one example, rather worn, but unmistakably referable to the interesting blackish var. (et ab.) *cyparissaria*, Mn.

TURKEY (1878, mostly, I understand, from the neighbourhood of Gallipoli).—*Acidalia ochrata*, Scop., three; *A. rufaria*, Hb., four; *A. turbidaria*, H.-S., five; *B. subsericeata*, Hw., one; *A. sodaliaria*, H.-S., one; *Zonosoma pupillaria*, Hb., two; *Larentia riguada*, Hb., one; *Gnophos sartata*, Tr., two large females; *G. stevenaria*, B., male; *Phasiane glarearia*, Schiff., male. Some of these species are new to my collection, and all are very welcome, as I had previously no Turkish material at all; apparently not many specimens of the eastern *Gnophos stevenaria* find their way into our British collections—at any rate, that at the British Museum contains only one poor example of it.

CORFU.—*Acidalia elongaria*, Rbr., one, dated Sept. 24th, 1897; and three nice specimens of the interesting little *Ellicrinia trinotata*, Metzner, all dated Aug. 11th, 1897.

PLATEA.—*Oulobophora* (Stgr. olim = *Lobophora*, Stgr. Cat.) *internata*, Püng. = *macedonica*, Stgr. A lovely male of this very interesting and recently (1888) erected species, taken on March 8th, 1898; the locality seems to be new, as Püngeler and Staudinger only record it from Asia Minor (one male) and Macedonia. Staudinger, in describing this species (as *macedonica*, vide 'Iris,' v. p. 219, pl. ii. fig. 19), proposed the generic name of *Oulobophora* for it and *externata*, H.-S., chiefly on account of the absence of the "lobes" in the male; authorities are divided as to the legitimacy of employing secondary sexual characters for the separation of genera, but the superficial aspect of the species in question strongly suggests that they are not very close to the true *Lobophoras*, &c., and I quite expect that further study will reveal fully sufficient characters to justify the retention of "*Oulobophora*" as a valid genus.

ATHENS (July, 1898). — *Acidalia marginepunctata*, Goeze, male, rather pale; *Rhodometra* (*Sterrrha*) *anthophilaria*, Hb., a long and interesting series (eleven males, five females) of the var. (or subspecies)* *rosearia*, Tr., varying much *inter se*—ten are predominantly rosy, six yellow.

CRETE.—A worn *Acidalia*, without precise locality, taken in May, 1897, ? *sodaliaria*, H.-S. Also from Canea (June, 1897):—*Acidalia ochrata*, Scop., ten; *A. consanguinaria*, Led., four; *A. consolidata*, Led., female, worn; *A. politata*, Hb., one, of the ab. *abmarginata*, Bhtsch.; *A. imitaria*, Hb., one, of the aberration with light ground colour; *A. ornata*, Scop., two, male and female; *Rhodometra sacraria*, L., two males; *Anaitis plagiata*, three; *Campptogramma bilineata*, L., a pretty aberration. And from Suda (June 16th, 1897):—*Acidalia ochrata*, Scop., six; and two doubtful little *Acidalias*, one apparently *A. elongaria*, Rbr.

* I have no right to a definite opinion, but I strongly suspect that Treitschke, Guenée, and others were right in making this a species, and that Staudinger's query "sp. propria?" should be answered in the affirmative.

CYPRUS.—One *Acidalia* (October, 1890), which I have not yet succeeded in determining.

MARMARICE, COAST OF SYRIA.—*Zonosoma pupillaria*, Hb., two, one closely approximating to *ab. nolaria*, Hb.

There are in all about thirty-nine species represented, about one-half of them being good local southern species; one belongs to the Geometridæ (*sens. str.*); about twenty to the Acidaliidæ (eighteen to Staudinger's great genus *Acidalia*); ten to the Larentiidæ; and only eight to the large family Boarmiidæ.

NOTES ON THE BEE-GENUS *HALICTUS*.

By T. D. A. COCKERELL.

In the 'Canadian Entomologist,' September, 1902, Mr. Charles Robertson gives a synopsis of the Halictinæ found in the vicinity of Carlinville, Illinois. In this work the old genus *Halictus* is divided into *Halictus*, Latr., *Lasioglossum*, Curtis, *Ervylæus*, Rob., *Dialictus*, Rob., *Chloralictus*, Rob., and *Paralictus*, Rob. One's natural wish is to accept these genera, as *Halictus*, in the broad sense, contains so many species; but, if they are valid, they should remain distinguishable when all the known forms are considered. In order to test the validity of some of the characters used by Robertson, I have examined a number of American and European species, the latter received through the kindness of Mr. H. Friese.

A character given for *Lasioglossum* by Mr. Robertson is "hind spur [of hind tibia] finely serrate" in the females. Unfortunately *H. xanthopus*, Kirby, the type of *Lasioglossum*, has this spur pectinate with four large blunt teeth, and several little ones. However, *Lasioglossum* is ordinarily easily distinguished from *Halictus* proper (as represented by *H. scabiosæ* in Europe, or *H. lerouxii* in America) by the short third submarginal cell, the outer margin of which is gently curved. In typical *Halictus* this cell is considerably produced, the outer margin showing a distinct double curve. Using this character of the venation, the following clearly belong to *Halictus* proper:—

AMERICAN.

lerouxii, *ligatus*,
parallelus, and *fasciatus*,
cited by Robertson.

EUROPEAN.

scabiosæ, *cariniventris*,
virescens, *maculatus*,
patellatus, *tetrazonius*.

H. patellatus, Mar. (a large black species with banded abdomen) has the hind spur of hind tibia of female with few large teeth. *H. virescens*, Lep., collected by Friese at Bozen, Tirol, April 30th, 1898, is a beautiful insect, bright olive-green, with continuous ochreous hair-bands on abdomen; it has the third

submarginal cell of the long type, but shorter than usual; the spur has few large teeth. This insect is clearly related to *H. fasciatus*. *H. cariniventris*, Mar., from Buda, 29th May, 1886, is a green species, with the abdomen covered with ochreous hair as in various American Anthophorids; the third submarginal cell is quite of the long type, though not very long. In *H. scabiosæ* and *H. maculatus* the teeth of the spur are short and triangular, so that the spur becomes coarsely serrate, just as in the American species referred to *Lasioglossum* (Robertson says for these "finely serrate," but under a high power it appears coarse enough).

Robertson not only separates the species with a short third submarginal from *Halictus*, but divides these into several groups, of which *Lasioglossum*, *Evylæus*, and *Choralictus* occur in Europe as well as America.

Lasioglossum, as thus restricted, includes comparatively large black species with abdominal hair-bands; species resembling *Halictus* proper except in the venation.

Evylæus and *Chloralictus* are ordinarily smaller, the abdomen commonly pubescent or pruinose, but not exhibiting definite hair-bands, and the second transverso-cubital nervure is more or less weak. The last character, on which Robertson lays stress, seems to me of doubtful value. The only difference between *Evylæus* and *Chloralictus* is that the former is black, the latter green or blue, or at least partly so.

If all these characters are held to be generic, we need more generic names. Thus, using the colour and spur, *Halictus* proper may be divided thus:—

- (1.) Colour green; spur pectinate—e. g. *virescens*.
- (2.) Colour black; spur pectinate—e. g. *patellatus*.
- (3.) Colour black; spur serrate—e. g. *scabiosæ*.

Again, *Lasioglossum* divides thus:—

- (1.) Colour black; spur pectinate—e. g. *xanthopus*.
- (2.) Colour black; spur serrate—e. g. *coriaceus*.

Even the character of the third submarginal cell fails us, as witness the following species:—

H. fasciatellus, Schenck, has the third submarginal between the long and short types, a slight double curve on outer margin.

H. lævigatus, Kirby, has a very large third submarginal, with a faint indication of a double curve, but its general shape is more as in *Lasioglossum*. The spur has numerous short strong teeth.

H. zonulus, Smith, has the third submarginal very large, twice as broad below as the second, but its outer margin is regularly and gently arcuate. The spur is minutely but distinctly beaded.

- H. olympica* Ckll., has a very large second submarginal, so that the third, though large, is not much bigger. Spur coarsely serrate.
- H. olympica subangustus*, Ckll., has the third submarginal essentially of the short type, but there is more or less of a double curve. Spur serrate.
- H. kincaidii*, Ckll., has a strong double curve, but third submarginal hardly of the long type. Spur with few long teeth.
- H. angustior*, Ckll., has the third submarginal essentially of the narrow type, but almost or quite twice as large as the small second submarginal. Spur with about four oblique teeth, the first quite long.

The following species (not including those enumerated by Robertson) have the third submarginal undoubtedly as in *LasioGLOSSUM* :—

AMERICAN.

pacificus, Ckll.
sisymbrii, Ckll.
similis, Smith.
politus, Smith (Mexico).

EUROPEAN.

vulpinus, Nyl.
major, Nyl.
malachurus, Kirby.
leucozonius, Schrank (but cell very
calceatus, Scop. [large].

Certain of these, as *H. pacificus*, *sisymbrii*, *leucozonius*, and *calceatus*, have the spur coarsely serrate as in *H. coriaceus*. *H. politus*, which looks much like these, has the spur with numerous moderately long teeth. *H. similis* has the spur with about four short oblique slender teeth.

The greatest reduction of spur-teeth I have seen results in the hind edge of the spur being apparently simple, but a high power lens shows it to be minutely beaded. This occurs in the American *H. amicus*, Ckll., and the European *H. zonulus*, Smith. *Halictus (Lucasius) cochlearcitaris*, Dours, has the third submarginal long, but there is hardly any double curve, and the angle is slightly appendiculate. This is a large black species with continuous hair-bands on abdomen; spur with teeth quite large towards the base, otherwise minute.

Nomioides is a genus of little bees with nearly the structure of *Halictus*, but all the form and colours of *Perdita*. *N. variegatus*, Oliv., and *N. pulchellus*, Schenck, have the third submarginal short, but slightly angled outwardly, and minutely appendiculate. Ashmead is wrong in treating *Lucasius* as a synonym of *Nomioides*, as Mr. Vachal has pointed out to me.

Mr. Vachal writes me that *Thrinchostoma*, Sauss., "is an *Halictus*, with the tongue longer than in *Halictus* s. str., and bodkin-shaped. The name of Saussure's genus is wrongly spelled by Dalla Torre and Ashmead.

East Las Vegas, New Mexico, U.S.A. :

May 9th, 1903.

DESCRIPTIONS OF SOME NEW SPECIES AND A NEW GENUS OF CHRYSOMELIDÆ FROM SOUTH AMERICA.

By MARTIN JACOBY.

(Concluded from p. 183.)

FRENAIS, gen. n. (Eumolpidæ).

Body elongate, glabrous, antennæ filiform, the intermediate joints slightly widened; eyes globular, entire; thorax transversely subquadrate, the sides entire; elytra wider than the thorax, rugosely punctured; tibiæ not emarginate; claws appendiculate; the prosternum deeply bilobed; the anterior margin of the thoracic episternum concave.

The genus here proposed will form part of the group Chalcophaninæ, on account of the bilobed prosternum; it seems most nearly allied to *Agrosterna*, Har., but differs entirely in its general shape and that of the thorax. Von Harold gives the shape of his genus as that resembling *Noda* and *Iphimeis*, which represents an ovate and convex form; in the genus here described the shape is that of *Colaspis* and allied genera, and the thorax is of equal width, neither narrowed nor deflexed, but transverse and subquadrate, which character separates it also from *Chalcophana* and the other genera of the group.

FRENAIS PERUANA, sp. n.

Dark bluish black; the thorax distinctly but irregularly punctured; elytra greenish-cupreous, very closely and strongly punctured, the interstices at the sides finely rugose. Length 7 mill.

Hab. Marcapata, Peru.

Head sparingly punctured, metallic bluish, with a rather deep depression between the eyes; the latter prominent, round; the anterior margin of the clypeus and the labrum fulvous; antennæ very long, bluish black, the apex of the lower two joints fulvous, second one very short, third and following joints nearly equal, the intermediate joints slightly widened (male); thorax transverse, the sides feebly rounded, the angles acute, slightly tuberculiform, the surface but slightly convex, metallic bluish, irregularly and not very closely punctured, the punctures of unequal size; scutellum dark purplish, subelongate; elytra greenish cupreous, extremely closely punctured, the punctures round and deep, the interstices rugose except near the suture where the punctures are somewhat regularly arranged in rows; under side and legs bluish black.

A single male specimen is contained in my collection in which the anterior tarsi are as usual dilated.

TITUBÆA (ANOMÆA) INSULARIS, sp. n.

Testaceous, antennæ extending to the base of the thorax, the latter impunctate, elytra elongate, not perceptibly punctured, legs slender. Length 6 mill.

Hab. Isle of Trinidad.

♀. Head produced, entirely impunctate, the vertex swollen and shining; the clypeus separated from the face by a feeble triangular groove, its anterior margin triangularly emarginate; apex of the mandibles black; eyes large, oval, nearly entire; antennæ very long for the genus, entirely testaceous, joints two and three very short, the following slightly triangularly widened; thorax strongly transverse, the posterior margin nearly straight, almost without median lobe, the posterior angles rounded, the surface entirely impunctate; scutellum broad at the base, the apex pointed and slightly carinate; elytra distinctly lobed below the shoulders, impunctate or with a few minute punctures at the base; the humeral callus sometimes with a small obscure piceous spot; legs elongate, the first joint of the tarsi about one-half longer than the second.

This is the first species of the genus recorded from any other part of the New World than Mexico; from the latter country three species are known. The Trinidad insect is much distinguished by the comparatively long antennæ, which extend quite to the base of the thorax, and have their joints much less transverse and serrate than in most other species of Clythridæ. I unfortunately know only the female; the male differs probably in having elongate anterior legs and tarsi. I received the specimens with a small lot of *Phytophaga* from the same locality.

OTILEA PERUANA, sp. n.

Bright metallic green or blue below, above dark æneous or green; antennæ black, the base fulvous; thorax confluent rugose at the sides and angulate; elytra deeply foveolate punctate-striate near the suture, confluent rugose at the sides, the interstices longitudinally costate. Length 8-9 mill.

Hab. Marcapata, Peru.

♀. Head closely rugose punctate, the intraocular space longitudinally sulcate; eyes large, epistome strongly punctured at the base, smooth anteriorly; antennæ bluish black, the lower three joints more or less fulvous; thorax short and strongly transverse, the lateral margins distinctly angulate at the middle and to a smaller degree before and below the latter, the middle of the disc deeply foveolate punctate, the interstices convex, the sides more crowded and confluent rugose punctate; scutellum smooth; elytra with single rows of very deep punctures near the suture, irregularly confluent punctate at the sides, the interstices longitudinally costate; femora metallic bluish or green; the tibiæ and tarsi purplish blue.

I would have referred this species to *O. amazonica*, Lef. (C. Rend. Ent. Soc. Belg. 1891) but for the following differences:—Lefèvre describes his species with the epistome smooth, and the elytra subgeminate punctate, also of greenish æneous colour; in the two specimens before me the under side of one is bright green, the other blue; in the green specimen, the elytral costæ are purplish, in the other, the interior of the punctures is golden.

Lefèvre's species was also obtained in another region. The author makes likewise no mention of the sex of his species; the elytral costæ are often to be found in the female only, the male may be of quite different sculpturing.

ALTERATION OF A GENERIC NAME.—The generic name *Micro-pyga*, described in the 'Entomologist,' p. 92, having been previously employed, I therefore alter it to *Clythropsis*.—M. JACOBY.

THE YOUNG LARVA OF LIPHYRA BRASSOLIS, WESTW.

By F. P. DODD.

Re Dr. Chapman's article in the April number. I cannot understand why Dr. Chapman writes that "it appears that there is no immediate chance of the problem being cleared up." I beg to state that there is no problem to be solved and never was, and that in my correspondence with Dr. Chapman I am unaware that I ever gave him any reason to assume that there was a problem in the matter. When his description of *L. brassolis* larva appeared, my surprise was very great indeed to observe that he was dealing with another insect altogether in his opening remarks! I at once guessed that I had, through carelessness, allowed a moth larva, from the same bottle in which I kept *L. brassolis*, to slip unperceived into the one I sent to Mr. South; still, it is beyond my comprehension how this could possibly be taken for the young larva of the butterfly, for every segment is, to the naked eye, remarkably clearly defined, whilst I believe it would puzzle many to discern the segments of even a one-third grown *brassolis* with the aid of a strong lens. As to the small moth caterpillar having Lycænid characteristics, I cannot venture to express an opinion; still, the statement that it has is most interesting news to me, for many species of "blue" larvæ have come under my observation. Had Dr. Chapman deigned to read my few remarks upon the larvæ, he would have observed that the little things from the eggs were stated to be oval and flat, and that large examples were lozenge-shaped, &c. I believe my letter to Mr. South stated that I was forwarding two sizes of larvæ, and I think this was also mentioned in my paper. (I cannot refer to this, or Dr. Chapman's descriptions, as they and sundry 'Entomologists,' &c., were blown away in our terrific cyclone of 9th March.) With the exception of the three furrowed lines upon the upper surface of the large caterpillars, there is no sign of segmental divisions, therefore what a change in a Lycænid larva! can any entomologist furnish us with one so extraordinary? From a very soft, fleshy, clearly segmented,

and rather square larva in the young stages, to a smooth, oval, leathery-looking creature in the later stages, with nearly three lines to indicate some of the segments! Dr. Chapman mentions in this April contribution of his that Queensland "may have surprises in store for us." Yes, Queensland has, but none so wonderful, I fear, as his *L. brassolis* larval changes. Has he not, though usually so very particular as to details, been a trifle careless, in more ways than one, in connection with his *L. brassolis* notes? If not, why does he persist in ignoring, in my correspondence with him, that the two species of young moth larvæ I refer to are obtained from a RED (large type, please, Mr. Printer) ants' nest in the ground, *not* from the nests of the green ants in the trees.

I do not know where these moths can be placed; one species is puzzling to more than one Australian entomologist, and to Dr. Chapman as well. If one is a *Lycænid*, both are; or if one is, according to Dr. Chapman, "not very distantly related to *Tinea*," then they both must be, for they are wonderfully alike in all their stages. Certainly, until the past week or two, I knew nothing of the round-segmented larva, except that it came from the same species of red ants' nests, but not in company with the larva with pointed segments; so, after receiving a card from Dr. Chapman stating that he was sending further notes to the 'Entomologist,' I very carefully overhauled the moths I had, and have found that all along I have had *two* species instead of one; then I examined the queer cocoons with protruding pupæ, and found them to be slightly different in size, shape, and colour. The dates and localities further assisted me, so that it is quite plain that I now have the moth I wished for; several I have had for nearly two years. When the moths, pupæ, cocoons, and larvæ are exhibited side by side, entomologists will understand why one could be deceived when only one species had been bred from the larvæ. However, I had ample grounds for "surmising" that Dr. Chapman's larva was that of a moth: I need not specify them here.

I very much regret my carelessness in the beginning, which has been the means of leading Dr. Chapman astray (certainly he had a very strange larva to deal with), and I have done my best to correct the error. I may add that I am very weary of the subject.

Finally, I "surmise" that when the young *L. brassolis* larvæ are found, they will very much resemble the full-grown specimens.

Mitchell St., Townsville.

N.B.—This poor little larva, which has caused so much trouble, lost all colour through immersion in a two per cent. formalin solution. Its colour should have been bright orange; smaller examples are pink or reddish.

ON THE NOMENCLATURE OF THE GENERA OF THE RHYNCHOTA; HETEROPTERA AND AUCHENOR- RHYNCHOUS HOMOPTERA.

By G. W. KIRKALDY, F.E.S.

(Continued from vol. xxxiv. p. 219.)

1835.¹ SERVILLE in Boisduval, Voy. Astrolabe, ii. 640. (β) *Dysdercus*.

1835. BRULLE, Hist. Nat. Ins. ix. 231-415. (γ) *Holotrichius*, 1835, t. *tenebrosus*; *Pseudophlæus*, 1835, t. *falleni*; *Hypsilonotus*, 1833, t. *venosus* (= *fulvus*, De Geer); *Augocoris*, 1835, t. *gomesii*. (δ) *Meropachys*, 1832.

1836. HERRICH-SCHAFER, Wanz. Ins. iii. (Febr.), 17-34. (β) *Lyctocoris*. (γ) *Pachycoris*, 1835, t. *fabricii* (= *torridus*). (δ) [*Acrocoris*, nec descr.]; (July), 59-90. (γ) *Dinocoris*, 1835, t. *annulatus* (= *macraspis*). GERMAR, Rev. Ent. iv. 71-3. (α) *Thlasia* t. *brunnipennis*; *Coloborrhis* t. *corticina*. CURTIS, Brit. Ent. (Sept.), 612. (α) *Rhyparochromus* t. *chiragra*.

1837. FIEBER, Weitenweber's Beitr. Natur. Heilk. i. 337-53. (α) *Ischnodemus* t. *quadratus* (= *sabuleti*). (β) *Oxycarenus* [n. n. for *Stenogaster*], *Phygadeuon*^{1a} [n. n. for *Heterogaster*, 1829]. W. KIRBY, Faun. Bor. Amer. iv. 275-85. (α) *Neottiglossa* t. *trilineata* (= *undata*); *Reduviolus* t. *inscriptus*; *Chiroleptes* t. *raptor* (= *serripes*); *Nabicula* [= *Reduviolus*] t. *subcoleoptrata*. EVERS-MANN, Bull. Soc. Nat. Moscou, 33-9. (α) *Hipporhynchus* t. *bifasciatus*. HOPE [now usually ascribed to Westwood], Cat. Hem. Hope, 1-46. (α) *Hoplistodera*, "Westw.," t. *testacea*; *Aplosterna*, "Hope," t. *virescens*; *Rhynchocoris*, "Westw.," t. *hamata* (= *humeralis*); *Urolabida*, "Westw.," t. *tenera*. (β) *Lyramorpha*, "Hope"; *Urostylis*, "Westw." (δ) *Plataspis*, n. n. for *Platycephala*, 1832 [= *Brachyplatys*, 1835]. WESTWOOD, Trans. Ent. Soc. Lond. ii. 18-24. (α) *Eumetopia* t. *fissiceps*; *Oncoscelis* t. *australasiæ*; *Cyclogaster*² t. *pallidus*; *Eucerochoris* t. *nigriceps*; *Enicocephalus* t. *flavicollis*. NEWMAN, Ent. Mag. v. 399. (α) *Bruchomorpha* t. *oculata*. SPINOLA, Essai Hém. Hétér. 1-383. (α) *Anisops* t. *nivea* (= *productus*); *Emesodema*³ t. *domestica*; *Cymbidus*⁴ t. *versicolor*; *Sirthenia* t. *carinatus*; *Hiranetis* t. *membranacea*; *Macroceræa* t. *grandis*; *Saccolideres* t. *sexfoveolatus* (= *inflatus*); *Sthienera*⁵ t. *angulosus*; *Corynomerus* [= *Merocoris*, Perty] t. *elevatus*; *Plaxiscelis* t. *fusca*;

¹ Date of publication doubtful, possibly after 1840.

^{1a} Preocc. Treitsch. 1833.

² Preocc. Macquart, 1834.

³ Homot. *Ploiaria*, 1786.

⁴ Homot. *Cimbus*, 1832.

⁵ Homot. *Harpactor*, 1832.

Nyttum t. *limbatum*; *Coryzoplatus* t. *pallens* (= *rhomboideus*); *Catoplatus* t. *costata* (= *fabricii*); *Serenthia* t. *atricapilla*; *The-rancis* t. *vittata*; *Resthenia* t. *scutata*; *Byrsoptera* t. *erythrocephala* (= *rufifrons*); *Vulsirea* tt. *ancora* and *nigrorubra* (both = *violacea*); *Sethenira* t. *testacea*; *Clavigralla* t. *gibbosa*; *Cymodemata* t. *tabida*; *Micropus*⁶ t. *genei*; *Henestaris* t. *genei* (= *laticeps*); *Niesthrea* t. *sidæ*; *Serinetha* [= *Leptocoris*, 1833] t. *rufus* (= *abdominalis*); *Lygæosoma* t. *sardea*; *Arocatus* t. *melanoccephalus*; *Sympiezorhincus* t. *tristis*; *Macropygium* t. *atrum* (= *reticulare*); *Chlorocoris* t. *tau* (= *complanatus*); *Erthesina* t. *mucorea* (= *fullo*); *Ochlerus* t. *cinctus* (= *marginatus*); *Schyzops* t. *ægyptiaca*; *Dichelops* t. *punctatus*; *Spongopodium* [= *Aspon-gopus*] t. *obscurum*; *Phyllocheirus*⁷ t. *servillei*; *Dyroderes* t. *um-braculatus*; *Epipedus* t. *histrio*; *Arocera* t. *aurantiaca* (= *acro-leuca*); *Proxys* t. *victor*; *Agonoscelis* t. *indica* (= *nubila*); *Heteropus*⁸ t. *lefebvrei*; *Cataulax* t. *macraspis* (= *eximius*); *Catacanthus* t. *nigripes* (= *incarnatus*, Drury); *Coryzorhaphis* t. *leucocephala*; *Elvisura* t. *irrorata*. (β) *Enithares*, *Heniantes*, *Verlusia*, *Derephysia*, *Artheneis*, *Apodiphus*, *Arvelius*, *Oplomus*, *Stiretrosoma* [= *Stiretrus*], *Solenosthedium*. (γ) *Physomerus*, 1835, t. *lineat-collis* (= *phyllocheirus*); *Gonocerus* [recte *Gonocere*], 1825, t. *in-sidiator*; *Largus*, 1835, t. *humilis*; *Dinidor*, 1829, t. *amethystina*. (δ) *Diplonycha*, 1832; *Sphærodema*, 1832; *Myctis*, 1814; *Dycti-onota*, 1832; *Phytocoryza*, 1814; *Euriophthalmus*, 1832; *Coreo-coris*, 1834; *Hyloris* for *Xylocoris*, 1831; *Nægeus*, 1832; *Cory-zus*, 1814; *Leptocoryza*, 1825; *Lygæus*, 1794; *Tetira*, 1803.

1838. CURTIS, Brit. Ent. (Sept.), 709. (α) *Harpocera* t. *bur-meisteri* (= *thoracica*). BURMEISTER, Gen. Ins. i. 3–20. (α) *Pedi-opsis* t. *tiliæ*. (β) *Oncopsis*, *Athysanus*, *Deltocephalus*, *Platy-metopius*.

1839. BURMEISTER, Handb. ii. 1010–13. (α) *Stenocoris*⁹ t. *tipuloides*. G. R. WATERHOUSE, Trans. Ent. Soc. Lond. ii. 194–5. (α) *Alleloplasis* t. *darwinii*. GERMAR, Zeitschr. Ent. i. 1–146. (β) *Alphocoris*, *Phimodera*, *Psacasta*, *Calliphara*, *Cæloglossa*. (γ) *Discocera*, 1832, t. *ochrocyanea*. (δ) *Arctocoris*, unnecessary alteration for *Ursocoris*, 1834. GERMAR, l. c. 187–92. (α) *Xero-phlœa* t. *grisea*. (β) *Clastoptera*, *Phylloscelis*. GERMAR, Verh. Leop. Akad. Naturf. xix. 203. *Ditomoptera* t. *dubia*^{9a}. SPINOLA, Rev. Zool. 199–206. (α) *Phrictus* t. *diadema*; *Euchophora* t. *recurva*; *Pyrops* t. *candelaria*; *Episcius* t. *guerini*; *Dilobura* t. *corticina*; *Omaloccephala* t. *festiva*; *Calyptoproctus* t. *lystroides*; *Plegmatoptera* t. *prasina*; *Dichoptera* t. *hyalinata*; *Monopsis* t. *tabida*; *Elidiptera* t. *callosa*; *Cladodiptera* t. *macrophthalma*

⁶ Preocc. Meyer, 1810 = *Ischnodemus*, 1836.

⁷ Homot. *Heteroscelis*, 1829.

⁸ Preocc. Pal. Beauv. 1805.

⁹ Homot. *Myodocha*, 1807.

^{9a} Now regarded as a coleopteron.

Plectoderes t. *collaris*; *Aræopus* t. *crassicornis*; *Mycterodus* t. *nasutus*; *Ommatidiotus* t. *dissimilis*; *Lophops* t. *servillei*; *Elastomscelis* t. *cimicoides*; *Acanalonia* t. *servillei*. (δ) *Achilius*, 1818. HERRICH-SCHAFFER, Wanz. Ins. v. (Sept.), 41-60. (γ) *Cæloglossa*, 1839,¹⁰ t. *lyncea*. SPINOLA, Ann. Soc. Ent. France, viii. 133-337, and 339-454. (δ) *Enchophora*, 1839. A. WHITE, Mag. Nat. Hist. n. s. iii. 537-48. (α) *Coleotichus* t. *costatus*; *Caliprepes* [= *Urolabida*] t. *grayii*; *Corimelæna* [= *Thyreocoris*, 1801] t. *lateralis*. (β) *Derepteryx*. WESTWOOD, Introd. Mod. Class. Ins. Synops. 115-24. (α) *Acalypta* t. *carinata*; *Gastrodes* t. *abietis*; *Plinthisus* t. *brevipennis*. (β) *Pilophorus*¹¹; *Polymerus*;¹² *Pachybrachius*. (γ) *Pseudophana*, 1835, t. *europæa*;¹³ *Delphax*, 1798,¹⁴ t. *clavicornis*; *Cyllecoris*, 1834, t. *agilis*; *Phytocoris*, 1814, t. *populi*; *Anthocoris*, 1814, t. *nemorum*, Linn.; *Arenocoris*,¹⁵ 1834, t. *ligeratus* (= *falleni*); *Rhopalus*, 1829, t. *capitatus*; *Bellocoris*,¹⁶ 1835, t. *maurus*; *Piesma*, 1825, t. *capitata*. *Macropsis*, 1834, t. *virescens*; *Lygus*, 1833, t. *coryli*. (δ) *Urtocoris* for *Ursocoris*, 1834; *Raphigaster*, 1832; *Agramma* (unnecessary new name for *Serenthia*, 1837), t. *læta*. ERICHSON, Arch. Ent. viii. 1, 281-4. (α) *Isodermus* t. *planus*; *Dicretotus* t. *prolixus*. WESTWOOD, Ann. Mag. N. H. ix. p. 118. (α) *Cystosoma* t. *saunderii*.^{23a} WESTWOOD, Proc. Ent. Soc. Lond. p. lxxiv. [reprint p. 61]. (α) *Ectinoderus* t. *longimanus*. *SCHIÖDTE, Kröyer's Nat. Tidsskr. iv. 279. (β) *Philia*.^{23b}

1840. SPINOLA, Rev. Zool. 331. (α) *Phricodus* t. *histrion* (= *hystrix*); *Chelochirus* t. *atrox*. HERRICH-SCHAFFER, Wanz. Ins. v. (Jan.), 61-88. [(β) *Typhlocoris*, nec. descr.]; l. c. vi. (Sept.), 1-20. (γ) *Discogaster*, 1835, t. *rhomboides*. WESTWOOD, Mod. Class. Ins. ii. 414-88. (δ) *Phyllomorphus*, 1832. ZETTERSTEDT, Ins. Lappon. 253. (α) *Pholetæra* [= *Aphrodes*, 1833], t. *sahlbergi*. (β) *Cicadula*, *Thamnotettix*. WESTWOOD, Trans. Ent. Soc. Lond. ii. 248-53. (α) *Ptilocnemus* [n. n. for *Ptilocerus*, 1831], t. *fuscus*. BLANCHARD, H. N. Ins. iii. 85-201. (α) *Strongylocoris* t. *leucocephalus*. (β) *Lygeomorphus* [= *Leptocoris*, 1833]. (δ)¹⁹ *Penthicus*, unnecessary n. n. for *Aphæna*, 1830. *Drytocephalus*, 1832; *Pæocera*, 1832; *Oxyrachis*, 1833. (γ) *Evagoras*, 1835, t.

¹⁰ Homot. *Solenosthedium*, 1837.

¹¹ This is credited to Hahn, 1826, but was not described by the latter. No species are mentioned with certainty by Westwood, and the genus is regarded by Westwood as equivalent to *Globiceps*, 1825.

¹² Referred also to Hahn, and no species mentioned in either genus.

¹³ Thus making *europæa* type of the previously unfixed *Dictyophora*, 1833.

¹⁴ Homot. *Asiraca*, 1797.

¹⁵ Thus *Pseudophlæus*, 1835, is homot. *Arenocoris*.

¹⁶ = *Odontotarsus* and *Eurygaster*, 1832.

^{23a} Arc. Ent. pl. xxiv. fig. 1 (published 1842 or 1843) is quoted, but this possibly refers to plates actually prepared but not yet published.

^{23b} I have not seen this work, and thus do not know if any types were stated.

eryt[h]rocephalus. (δ) *Pseudophlæus*. (γ) *Merocoris*, Hahn, 1834, t. *denticulatus*; Arvelius, 1837, t. *gladiator* (= *albopunctatus*); *Heteronotus*, 1832, t. *besckii*. WESTWOOD in Duncan's Jardine's Nat. Libr. Intr. Entom. i. 259-86. (α) *Polyneura* t. *ducalis*.

[1838-]42. (18^a) RAMBUR, Faune Ent. Andalousie, Hem. 19^a 95-212. (α) *Mijas* t. *fasciata*; *Stenocoris*¹⁷ t. *gracilis*. (β) *Craspedum*.¹⁸ (δ) *Ploiara*, 1787.

1841. WESTWOOD, Proc. Linn. Soc. Lond. i. 82-5. (σ) *Myisia* t. *pallida*; *Thracia*²⁰ t. *sinuosa*; *Phenice* t. *fritillaris*; *Patara* t. *guttata*; *Lydda* t. *elongata*; *Cenchrea* t. *dorsalis*; *Zeugma* t. *vittata*; *Deribia* t. *coccinea*. WESTWOOD, Trans. Linn. Soc. Lond. xix. 1-22. (δ) *Diospolis*, unnecessary n. n. for *Lydda*, 1841. WESTWOOD, Trans. Ent. Soc. Lond. iii. 18-28. (α) *Oxythyreus* t. *cylindricornis*; *Amblythyreus* t. *rhombiventris*; *Macrothyreus*²¹ t. *cimicoides*. A. WHITE in Gray's Trav. Austral. App. i. 472. (α) *Chærocynus* t. *foveolatus*. CARREÑO, Ann. Soc. Ent. France, x. 275-7. (α) *Odontoptera* t. *spectabilis*. A. COSTA, l. c. 279-308. (α) *Pachytoma*²² t. *minor*; *Aphanosoma* t. *italicum*: *Tritomacera* t. *aphanoides*.

1842. *GERMAR, Munst. Beitr. z. petref. v. 85-7. (α) *Actea sphinx*.^{22^a} HOPE, Trans. Linn. Soc. Lond. xix. 132-6. (α) *Corethrura* t. *fuscovaria*. A. WHITE, Entom. i. 406. (α) *Probenops* t. *dromedarius*. A. WHITE, Trans. Ent. Soc. Lond. iii. 84-94. (α) *Ceratocoris* t. *bucephalus*; *Coriplatus* t. *depressus*; *Cephaloplatus* t. *pertyi*. (β) *Tectocoris*, *Pæcilochema*,²³ *Cyrtocoris* [n. n. for *Oxynotus*]. (δ) *Calliprepes*, 1839. WESTWOOD, Cat. Hem. Hope, ii. 1-26. (α) *Brachytes* t. *bicolor*; *Ceratopachys* [= *Homæocerus*] t. *capensis* (= *nigricornis*); *Acanonicus* t. *laticornis*; *Stenoscelidea* t. *albovaria*; *Coriomeris* t. *pilicornis* (= *denticulatus*); *Pyrhotes* [= *Leptocoris*] t. *abdominalis*. (β) *Metapodius* [n. n. for *Acanthocephalus* (sic), 1832.] (γ) *Derapteryx* (sic) t. *hardwickii*, 1839.

¹⁷ Preocc. Burm. 1839.

¹⁸ = *Phyllomorphum*, 1832.

^{18^a} Date uncertain.

¹⁹ Preoccupied Fald. 1835.

^{19^a} Hagen says, "1-176."

²⁰ Preocc. Blainv. 1825.

²¹ Homot. *Macrocephalus*, 1787.

²² Nec Swainson = *Labops*, 1835.

^{22^a} Now regarded as a coleopteron.

²³ Preocc. Stephens, 1829.

(To be continued.)

NOTES AND OBSERVATIONS.

YELLOW COLOURING OF COCOON OF *PLUSIA MONETA* RESULT OF MOISTURE.

—I do not think that Mr. Bird's theory can be the correct one, as we have records of *P. moneta* larvæ spinning up in similar positions as regards air, light, and moisture, yet producing one permanent white cocoon, and one white cocoon which afterwards turns to a yellow colour. In my opinion the yellow colour is due to some secretion of the larva, which, however, is probably used up in some other way than in colouring the silk of the cocoon, when the larva has not fed for some time before it commences to spin up. Moisture probably hastens the change from white to yellow, and perhaps it may even be necessary for this change; but still I do not think it is the primary cause. If Mr. Bird's theory is correct, there ought to be a much larger percentage of permanent white cocoons amongst the second brood than amongst the first, as there is not nearly so much moisture in the atmosphere during late summer as there is during late spring; and as the leaves of *Delphinium* and *Aconitum* are both older and dryer, the larva could not obtain much (if any) moisture from this source. In conclusion, I must thank those who have of late been so kind as to furnish me with material and facts relating to this variation, and say that in future I shall feel grateful to any who will kindly give me any facts or material relation to this variation, to enable me to pursue my experiments to an end.—RALEIGH S. SMALLMAN; Carlton House, Herne Hill, July 13th, 1903.

APATURA IRIS REARED ON WILLOW.—Last spring I obtained seven larvæ of *Apatura iris*, which I supplied with willow, and all pupated successfully. At first I had provided them with sallow, but they refused to eat this for several days, and were consequently without food until the willow was introduced and accepted.—W. B. POLMAR; 18, Waverley Road, Cotham, Bristol.

PLUSIA NI AT PENZANCE, 1894.—On looking over some undetermined specimens in the possession of the late Mr. W. Baily, of Penzance, in July, 1894, I detected eight worn specimens of *Plusia ni*. These Mr. B. informed me he had taken recently in one of his gardens. I told him that Prof. Riley had given the name of *brassicæ* to a *ni*-like *Plusia* from its feeding on cabbage, &c.; whereupon Mr. B. set the neighbourhood to work at larva-hunting, with such success that he bred a considerable number of the required insect. I have not mentioned this fact, because I considered that the discovery belonged to my friend, to use as he thought fit; but I see no reason to keep the secret any longer. Mr. Baily told me that, although the larvæ of *ni* and *gamma* resembled one another, he could easily differentiate the two. I have since seen our national series of *ni* from all parts of the world, and have come to the conclusion the *ni* and *P. brassicæ*, Riley, are synonymous.—H. G. KNAGGS; Folkestone, June 19th, 1903.

NOTES ON THE LICTOR CASE-MOTH.—Without exception the Lictor case-moth (*Entometa ignobilis*) is the most plentiful species of case- or housebuilder moth in Tasmania. The Saunders case-moth (*Metura elongata*) of the mainland does not extend its range to these shores.

The larvæ of *Entometa ignobilis* feed principally on the various species of *Acacia* and *Eucalyptus*. The perfect insects are very rarely seen: that such should be the case is not to be wondered at, as the males on emerging, in confinement, dash themselves to pieces in a few minutes against the sides of the cage. They are remarkable for the length of the abdomen, the power they have of elongating it, and the manner in which they lash it from side to side. The females never leave the cases, but simply place the posterior end of the abdomen close to the lower aperture of the case. The male, when ready to change to the pupa state, reverses its position in the case, so that its head is close to the lower aperture. The female, on the other hand, pupates in the same position as when a larva. The young are brought forth not in the egg state but as minute larvæ, which, if one is fortunate enough, may be seen issuing in immense numbers from the body of the female, each letting itself down by a slender thread of silk, it being soon wafted to some leaf of the tree. Each immediately spins a silk case for itself, fastening grains of bark to its exterior surface. A very small proportion of larvæ turn to imagines owing to the attacks of ichneumon and dipterous parasites. Recently I was fortunate enough to witness a nearly adult larva of this species enlarging its case. It occurred to me that a description of the process might not be without some interest to many. First the edge of the mouth of the case was tightly fastened with silk to the twig from which a portion was to be cut. Then the caterpillar protruded itself half out of its case and commenced nibbling the bark round the twig. In a very short while it was severed. I should have before remarked that the top of the twig and several leaves were bitten off before cutting a piece the desired length (about an inch). As soon as the portion was severed it was grasped by the caterpillar in its legs, which acted in the capacity of hands, and then given a coating of silk. This occupied two or three minutes. It was marvellous to watch the ease with which the piece of twig was handled, being turned over and over, backwards and forwards, without a seeming effort. It was nearly always grasped in the middle. After the coating process was finished the caterpillar retreated inside its case, laying the twig lengthwise across the mouth. It then bit an opening about a quarter of an inch from the top through the fabric, came half way out through the opening, and pulled down the piece of twig. It was then lightly fastened by one end near the top of the case. The caterpillar then proceeded to fasten it securely for half its length among the other bits of twigs already there. This done, it retreated into its case and fastened up the rent it had made in the fabric, at the same time securely attaching the top of the twig. Unfortunately I never witnessed the lower portion of the twig being fastened down, but should imagine the process was the same. Next day it was practically impossible to distinguish this twig from the others. Its thickness was that of, say, a two-inch nail. Sometimes the twigs project an inch or more beyond the end of the case, but the method of fastening on is the same.—FRANK M. LITTLER; Launceston, Tasmania: March 16th, 1903.

CAPTURES AND FIELD REPORTS.

PLUSIA CHRYSITIS.—Mr. Lawrance, in his note (*ante*, p. 193), mentions his and friends' experience respecting *Plusia chrysis* being scarcer of late years. My experience is quite to the contrary, as the imagines are to be taken freely at bramble bloom in company with *Thyatira batis* and *Habrosyne derasa*, at Finchley and Mill Hill; and since coming here to reside I have taken it at bramble bloom, and also at the blossoms of *Delphinium* (on four occasions) in my garden. The larvæ, too, could be easily found by beating the nettles over newspapers at night, at Finchley, and would no doubt be found, by careful work, in other suburban districts.—V. ERIC SHAW; Salisbury Road, Bexley, Kent, July 14th, 1903.

PLUSIA CHRYSITIS.—With reference to Mr. A. J. Lawrance's remarks as to this species (*ante*, p. 193), I may mention that I took one specimen on the 18th of this month, while dusking on the railway embankment at the back of my house. This is the first time I have seen the insect near London during my four years' collecting.—G. B. BROWNE; 43, Southbrook Road, Lee, S.E., July 21st, 1903.

PLUSIA CHRYSITIS.—Referring to the note on *Plusia chrysis* in the London district (*ante*, p. 193), it may be of interest to say that here, at least eighteen miles from London, there is no scarcity of this moth. Last autumn I beat the larvæ abundantly, and at present I am finding the imago on the wing.—(Rev.) W. CLAXTON; Navestock Vicarage, Romford, July 10th, 1903.

DRAGONFLIES IN BANFFSHIRE.—On July 13th last I took the following dragonflies at Crannoch Loch, near Cullen, situated in an elevated hollow within a mile of the sea:—*Libellula quadrimaculata*, L.; *Pyrhosoma nymphula*, Sulz.; *Ischnura elegans*, Lind.; *Enallagma cyathigerum*, Charp.—HENRY H. BROWN; Cupar-Fife.

WHITSUNTIDE IN THE NEW FOREST, 1903.—We devoted our Whitsuntide holiday this year to entomology in the New Forest, and having met with some success, thought that a brief account of our doings might be of interest to some of the many entomologists who visit that famous hunting-ground. We arrived at our diggings (some six miles from Brockenhurst) late Friday night, May 29th, where the inn-keeper had awaiting us a female *Smerinthus ocellatus* that he had found, which subsequently deposited a number of ova. There had been a storm in the evening, and much rain fell during the night, but, luckily, Saturday, Sunday, and Monday were fine and hot.

Several species of Lepidoptera were met with in considerable numbers, viz.:—*Gonopteryx rhamni*, *Argynnis euphrosyne*, *Nisoniades tages*, *Panagra petrararia*, *Ematurga atomaria*, *Bupalus piniaria* (males only), and *Thera variata*; while the following were seen in lesser numbers:—*Pieris brassicae*, *P. rapæ*, *P. napi*, *Euchloë cardamines*, *Pararge egeria*, *P. megara*, *Cænonympha pamphilus*, *Thecla rubi*, *Polyommatus phleas*, *Lycæna icarus*, *Syrichthus malvæ*, *Euchelia jacobæ*, *Macrothylacia rubi* (several males seen, but only one captured), *Phytometra viridaria* (on the heaths), *Euclidia mi* and *E. glyphica* (beside the

railway), *Venilia maculata*, *Boarmia consortaria* (on fir-trunks), *Tephrosia punctularia*, *Acidalia remutaria* (including some nice forms), *Cabera pusaria*, *C. exanthemata*, *Bapta temerata*, *Macaria liturata*, *Laurentia pectinitaria*, *Melanthia ocellata*, *Pyrausta ostrinalis*, *Hydrocampa nymphaea*, *Botys pandalis*?, *Harpella geoffrella*, *Scoparia ambigualis*, and *S. dubitalis* (on trunks).

Dusking was not very successful, and the only additional species taken in this way were:—*Phlogophora meticulosa*, *Epione advenaria*, *Rumia cratæata*, *Iodis lactearia*, *Bapta taminata*, *Eupithecia venosata*, *E. nanata*, *E. vulgata*, *Hypsipetes ruberata* (two), *Melanippe sociata*, *M. fluctuata*, *Coremia ferrugata*, *C. unidentaria*, *Cidaria corylata*, *C. truncata*, and *Pardia tripunctana*.

May 31st we spent in the company of Mr. E. Morris, of Brockenhurst, and devoted most of the day to the "beehawks," of which we secured a few of both species. On the same day we saw one or two *Nemeobius lucina*, and found a male *Smerinthus ocellatus* at rest. Single specimens of *Nola confusalis*, *Dasychira pudibunda*, *Ephyra pendularia*, and two *Erastria fuscule* were also taken during our visit. Larvæ appeared to be scarce, and we did very little beating. We, however, found two batches of *Taniocampa miniosa* larvæ, and kept about fifty each.

With regard to the Odonata, *Calopteryx virgo* was common by nearly every stream, and several of the commoner species were well out, such as *Platetrum depressum*, *Agrion puella*, and *Pyrrhosoma nymphula*. *Libellula quadrimaculata* and *Orthetrum carulescens* also fell to our nets; and we were very pleased to secure *Anax imperator*—a splendid insect! *Gomphus vulgatissimus* was just emerging at the Blackwater, and several empty pupa skins were found on the reeds by the water's edge, while two of the imagines were discovered drying their wings above them. This insect was also seen hawking up and down the stream higher up, but only one specimen was secured. On the same patch of rushes pupa-skins of *Calopteryx virgo* were also found.

Coleoptera were not seriously worked, but we brought home, amongst others, *Silpha atrata*, *Cetonia aurata*, *Melolontha vulgaris*, *Neorophorus mortuorum*, *Rhagium bifasciatum*, *Donacia linearis*?, *Cryptocephalus aureolus*, and *Lina populi*.—PHILIP J. BARRAUD and KENNETH G. BLAIR.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—June 3rd, 1903.—Professor E. B. Poulton, M.A., D.Sc., F.R.S., President, in the chair.—Mr. G. C. Champion exhibited numerous specimens of *Coccinella distincta*, taken in the pine woods of Woking. They were found, as usual, running about the ground in company with *Formica rufa*, and were perhaps wanderers from some other locality. Mr. Donisthorpe said the species was still common at Weybridge in the nests of *Formica rufa*, and that he had observed it also at Bexhill, while Mr. Chitty noted its former occurrence in Blean Woods in great numbers. The history of the larvæ, he said, had not been worked out.—Mr. H. St. J. Donisthorpe

exhibited a very remarkable melanic form of *Halysia 18-guttata*, L., black with white spots, the type, which was also exhibited, being light brown with white spots. The former was taken at Oxshott on May 22nd. He also exhibited *Stilicus fragilis*, Gr., a melanic form with a black thorax instead of red, as in the type, taken at Shirley on May 15th; and *Staphylinus fulvipes*, Scop., taken by himself at Bamber Forest on June 1st, a new locality for this rare beetle.—Dr. T. A. Chapman exhibited two full-grown larvæ of *Thestor ballus*, sent by Mr. H. Powell, from Hyères, and described them in their various stages. He also exhibited a larva of *Heterogyna paradoxa*, full-fed, reared from the egg at Reigate; and a cocoon of *Orgyia auro-limbata*, with parasite Braconid. In this instance a larva produced an imago and the parasite. The cocoon, when opened last October, showed the cocoon of a Microgaster within it—a dense oval ribbed cocoon of whitish silk, with longitudinal darker flutings. The Microgaster and the moth both came from the same larva, and the moth, though containing few eggs (not being fertilised), laid none. An imago and a parasite from the same larva have not infrequently been recorded, but the occurrence has very often been doubted.—The President exhibited the dry form of *Precis actia*, bred by Mr. Guy A. K. Marshall from an egg laid by a female of the wet form. The parent was captured by Mr. Marshall at Salisbury, Mashonaland (5000 ft.), on February 14th, 1903; the egg was laid on the following day. It hatched February 20th; the larva pupated March 16th; the perfect insect, a male, emerged March 28th. The differences between these two forms are as astonishing as those between the two phases of *Precis antilope*. The representation of a dead leaf in the dry *actia* is slightly more elaborate than in *antilope*. Both species have an equally beautiful mid-rib-like stripe, but the former alone present the appearance of minute holes near the tip of the simulated leaf, due to two white semi-transparent spots. This is the third South African species of the genus *Precis* in which Mr. Marshall has produced incontrovertible evidence of the specific identity of forms widely separated in colours, patterns, shape, relation of upper to under side, &c., and even instinct, including the selection of a particular type of country.—The President also showed a small series of ants, part of a much larger collection made by the late W. J. Burchell in Brazil between the years 1825 and 1830. They were obtained with his other vast zoological and botanical collections at Rio or its neighbourhood, or in the course of the long journey from Santos to Pará. Considering their great age, the specimens were wonderfully well preserved, and are accompanied by remarkably exact and detailed data, and, in many cases, interesting notes on habits, instincts, &c.—Mr. O. E. Janson communicated a paper “On the genus *Theodosia*, and other Eastern Goliathides, with descriptions of some new species.”—Colonel C. Swinhoe communicated a paper on “New genera and species of the family Lymantriidæ in the National Collection.”—Mr. G. W. Kirkaldy communicated a “Memoir on the Rhynchota collected by Dr. Arthur Willey, chiefly in Berara and Lifu.”—Professor E. B. Poulton gave an account of “Experiments in 1893, 1894, and 1896 on the colour relation between certain lepidopterous larvæ and their surroundings, and especially the effect of lichen-covered bark upon *Odontoptera bilentata* and *Lasiocampa quercifolia*.”—H. ROWLAND-BROWN, *Hon. Sec.*

SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—June 11th, 1903.—Mr. E. Step, F.L.S., President, in the chair.—Mr. Turner exhibited (1) *Anisopteryx ascularia*, a dark form from Lewisham and a light one from Dorking; (2) a dark suffused specimen of *Hybernica marginaria* from Dorking; (3) a series of *Dasycera sulphurella*, bred from decaying wood at Loughton, and pointed out the secondary sexual characters, the males being much the less developed in that respect.—Dr. Chapman, (1) a larva of *Thestor ballus*, bred from an ovum sent by Mr. H. Powell, of Hyères, and pointed out the characters of the species and its intermediate nature between the genera *Lycana*, *Thecla*, and *Chrysophanus*; (2) a coleopteron, *Ovina* (*Chrysochloa*) *tristis* var. *smaragdina*, bred from the egg at Reigate (from ova found near Lake Maggiore), the larva had been at large since last September, and the imago had just been found.—Mr. Garrett, a fine series of *Triphæna fimbria*, bred, from Wimbledon Common, including among other forms the pale grey type, var. *rufa*, var. *brunnea*, and var. *solani*.—Mr. McArthur, a bred series of *Eupithecia venosata* from the Shetland Isles; the southern, Cunningsburgh, examples were much darker and larger than those from Unst, in the extreme north. The larvæ were always on *Silene inflata*.—Mr. West (Greenwich), the rare *Necrophorus vestigator*, from a dead rook, and *Harpalus servus*, under stones; together with the hemipteron *Gnathosomus picipes*, all taken at Yarmouth in May.—Mr. Carr, ova of *Hylophila prasinana*. Dr. Chapman noticed a great resemblance between this species and the *Acronyctas*, but only in the ova.—Mr. Sich, larvæ of *Taniocampa miniosa* from Brentwood.—Mr. Lucas, beautifully coloured drawings of *Ephyra pendularia* var. *subroseata*, the local Staffordshire form (see Entom. xxxv. p. 275 (1902)).—Mr. McArthur reported having bred a specimen of *Dicranura vinula*, which had been lying over as a pupa since 1901. Mr. Sich reported having found larvæ of this species at San Moritz, 6000–7000 ft. elevation, and he had also found *D. furcula* at the same elevation.—HY. J. TURNER, *Hon. Rep. Sec.*

BIRMINGHAM ENTOMOLOGICAL SOCIETY.—May 18th, 1903.—Mr. G. T. Bethune-Baker, President, in the chair.—Mr. R. C. Bradley exhibited a fine series of *Bombylus discolor* from Ventnor, Isle of Wight, where they were taken last April. They were chiefly males, and all were taken in one small spot, though he believes that the species occurred all over the island.—Mr. J. T. Fountain, a series of *Dasychira pudibunda*, bred from a female found on heather at Sutton last year; also a series of *Taniocampa munda* from Yorkshire, bred, one of which was reddish in colour, and the black spots were represented by a reddish blotch on either wing, the pair of dots being only just discernible; also a few butterflies taken by a soldier friend in Sierra Leone.—Mr. Bethune-Baker exhibited another boxful of Sierra Leone Lycenidæ, including some nice new species.

ENTOMOLOGICAL CLUB OF LONDON.—A meeting was held at Weybridge on July 17th last. Although a very much larger number had been invited, only six were able to attend, and of these two were members. A little field entomology had been effected during the earlier part of the day, and at seven o'clock the visitors and members dined with the chairman and host, Mr. G. T. Porritt, of Huddersfield, at the 'Hand and Spear' Hotel.

RECENT LITERATURE.

N. LEON. 'Recherches morphologiques sur les pièces labiales des Hydrocores.' Jassy, 1901. Pp. 1-13 (1). (15 text figs.).

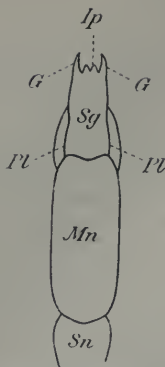
ONE of the controverted questions in the morphology of insects is the origin of the labium in Rhynchota; a summary of this, the latest work on the subject, will therefore be of interest. Ratzeburg, Burmeister, Chatin, Wedde, and Leon hold that in the formation of the labium, the labial palpi, which are united along the median line, have also taken part. On the other hand, Westwood, Newport, Latreille, Gerstfeldt, and Geise believe that the palpi do not contribute to the formation of the labium. Recently, Heymons, in an extensive work (1899, 'Beiträge zur Morphol. und Entwicklungsgeschichte der Rhynchoten, 1899, Nova Acta Leop. Carol. Acad. Naturf. Halle, lxxiv. pp. 349-456, plates xv.-xvii. and 5 text figs.), pronounced against their existence, on the ground that in the Rhynchota the labium is composed of four segments, and that the palpi are inserted on the third segment, and not on the second, which is homologous with the mentum in the mandibulate insects. More recently Leon has returned to the charge in the abovenamed brochure.

The learned Rumanian professor declares that Heymons' objection is disposed of when one considers that the labial palpi are not inserted directly on the mentum, but on an intermediate piece (*palpiger*), in such mandibulates as *Phasma*, *Iapetus*, *Gryllus*, and *Silpha*, and that in all these the palpi are inserted, not on the second but on third, as in those waterbugs which have a quadrisegmentate labium. The palpi are inserted directly on the mentum only in those mandibulates in which the *palpiger* is wanting. This leads to the supposition that the quadrisegmentate labium in waterbugs originated from a mandibulate labium provided with a *palpiger*, and that the trisegmentate labium in other waterbugs is developed from a mandibulate labium lacking the *palpigers*.

The submentum is formed by the coalescence of the two cardines, and the mentum by that of the two stipites; the third segment between the mentum and the ligula is formed by the coalescence of the two *palpigers*, consequently the labial palpi, even in *Gerris* and *Halobates*—where the labium has four segments—occupies its correct morphological situation. The most important comparative-anatomical fact, proving that the appendages described by Leon in *Benacus*, *Zaittha* [recte *Belostoma*], *Gerris* and *Velia*, are labial palpi, is that the position they occupy on the labium is exactly the place the labial palpi occupy in the mandibulata.

Leon distinguishes two labial types in waterbugs; one composed of four segments, the other of three.

The rostrum is trisegmentate in *Sphærodema* (= *Appasus* and *Diplo-nychus*, *Rakatra*, *Laccotrephes*, *Nepa*, *Mononyx*, *Gelastocoris* (= *Gal-gulus*), *Pelocoris*, &c., and is of a very similar type throughout the series. The labium appears to be composed, throughout its length, of two symmetric halves, united along the median line. The



Labium of *Sphærodema* (= *Diplonychus*) *rustica* (after Leon). Sg. = Subgalea. Mn. = mentum. Sn. = submentum. Pl. = Labial palpi. Ip. = Inter- and præ-maxillæ. G. = Galea.

basal segment is homologous with the submentum of the mandibulata, and is formed by the coalescence of two sclerites, corresponding to the two cardines or submaxillæ. The second is homologous with the mentum, and is formed by the coalescence of two pieces, corresponding with the two stipes or maxillæ. The third, or terminal, is homologous with the ligula, and is formed by the union of the subgalea, galea, intermaxillæ, and præmaxillæ. The basal of the ligula is formed by the coalescence along the median line of the two subgaleas. The lateral terminal lobes are homologous with the galea, corresponding with the lobi superiores of Kirby. The median terminal lobes are homologous with the two intermaxillæ, and the two præmaxillæ united along the median line.

As regards Heymons' objection, that the labial palpi in waterbugs are not sufficiently varied; compared with the labial palpi of the mandibulata, this is certainly so, but

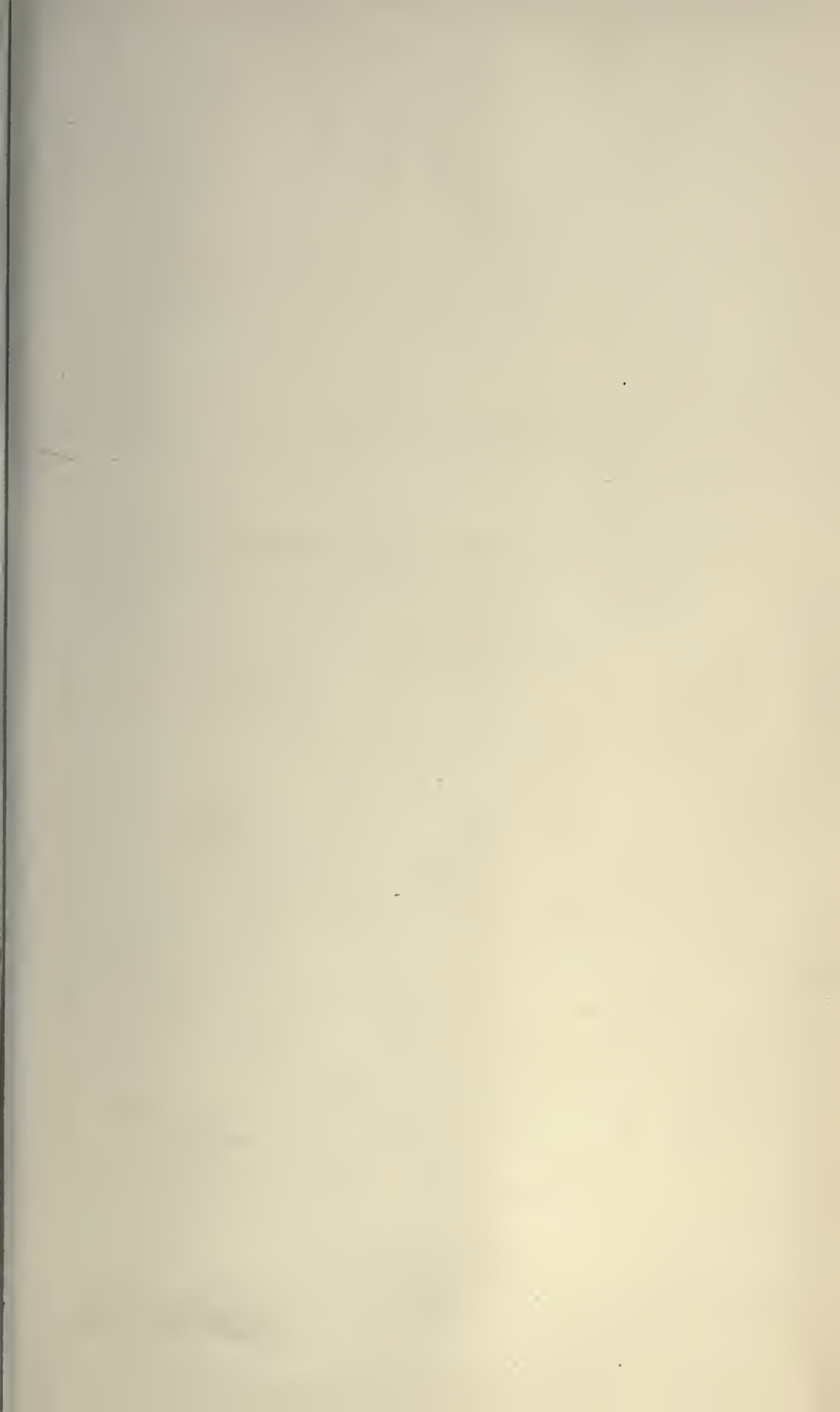
on comparing them with the extremely uniform rhynchotal rostrum, one finds that they are really sufficiently variable. If the complex maxillæ of the mandibulata have become in the Rhynchota simple, uniform, unvarying stylets, why could not the labial palpi assume by degeneration the little-varied forms they present in the latter order? As a matter of fact, there is a certain amount of variation in the labial palpi of waterbugs. In *Ilyocoris* and other Naucoridæ, they are merely tiny rudiments; in *Benacus* and other Belostomatidæ, they are well developed. They present rudimentary articulation in *Mononyx*, while in *Gelastocoris* (= *Galgulus*) they are triarticulate.

As the great majority of present-day authors, even Heymons, consider the rostrum to be labial, Leon concludes that his homologies, as set forth above, can be considered correct.

The 4-segmentate labium, as represented by *Halobates*, is discussed briefly; Leon considers the homologies more difficult to determine than in the other type, but concludes that the statements made above are probably correct.

The paper is marred by a number of misprints, particularly in the scientific names of the bugs. The only one likely to mislead is on page 8, five lines from top, where "trois" should be "quatre."

G. W. KIRKALDY.





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TWO NEW SPECIES OF LEPIDOPTERA FROM THE WADY EL NATRON, EGYPT.

By WILLIAM WARREN, M.A., F.E.S., and the Hon. N. C. ROTH-
SCHILD, M.A., F.L.S.

(PLATE IV.)

DURING a small expedition of the junior author and Mr. Francis Henley to the Natron Valley, five species of Lepidoptera were secured, of which two—a Noctuid and a Geometrid—are new, and are here described for the first time. All the specimens in question came to light.

METACHROSTIS COSTIPLAGA, sp. nov. Figs.: 1, ♂; 2, ♀.

Fore wings pale or dark ashy grey, the transverse lines fine, black, edged with yellowish; first at about one-third, vertical, forming three small curves; second from five-sixths of costa to three-fourths of inner margin, sinuous, more or less parallel to the hind margin; orbicular stigma round, touching first line; reniform with only the lower inner edge visible, the rest being lost in a large cream-coloured blotch lying within the sinus of the outer line, and starting from middle of costa; submarginal line pale, indistinct, in the female edged by a dark line; marginal line dark; fringe grey, chequered with darker. Hind wings white, with a slight discolouration towards hind margin extending over the three median nervules, expanded in the female into a slight submarginal cloud, darkening the veins, and marked beyond by a dark marginal line and shade in the fringe, which is otherwise white. Under side of the fore wings bluish white, with the fringe and cell-spot dark; the hind wings cream-coloured. Head and thorax dark grey; palpi cream-coloured, the third joint dark; abdomen cream, legs cream-coloured, the tarsi dark spotted. Expanse of wings: male, 26 mm.; female, 28 mm.

Three males and one female from Bir Victoria, March 5th, 1903.

XENOBISTON, gen. nov.

Fore wings ample; costa straight, apex rounded, hind margin long, obliquely curved, inner margin somewhat convex. Hind wings with both angles rounded, hind margin faintly indented beyond cell, more noticeably in the female. Antennæ of male broadly bipectinated, the pectinations strongly ciliated; of female shortly bipectinated. Shoulders, patagia, thorax, and pectus densely and roughly haired; face smooth, prominent; palpi quite short, rough-haired, no joints visible; tongue absent; frenulum present, very fine; mid and hind tibiæ with a pair of short terminal spines. Neuration: fore wings, cell three-fifths of wing; discocellular concave; first median nervule at two-thirds, second close before third; radials normal, veins 7, 8 stalked from a little before end of cell, 9, 10 stalked, 9 anastomosing with 8, 11 free. Hind wings, costal anastomosing with subcostal for half of cell; cell two-thirds of wing; discocellular inagulate, 3 and 7 both just before angles of cell, vein 5 weak.

Type. *X. casta*, sp. nov.

The neuration is anomalous, but the genus seems to come nearest to *Erannis*. Hüb., in which vein 5 of the hind wing is also intermediate between a vein and a fold.

XENOBISTON CASTA, sp. nov. Figs.: 3, ♂; 4, ♀.

Fore wings pearl-grey, the basal third white, the middle third occupied by a flesh-coloured fascia, the lunulate margins of which are slightly marked with dark scales; the fascia projects outwards a little above the median vein, containing there a whitish centred dark-edged ocelloid cell-spot; costa pale throughout, the fascia stopping short at the subcostal vein; fringe concolorous. Hind wings with the fascia very obscurely marked in darker grey, externally pinkish. Under side uniformly pearl-grey without markings. Head and thorax pure white; abdomen pearl-grey, towards the base tinged with flesh-colour. Palpi and pectus white; legs tinged with pale grey; antennæ ferruginous. Expanse of wings: male, 30 mm.; female, 38 mm.

A pair from Bir Victoria; March 5th, 1903. The male quite perfect, the female somewhat faded, and in consequence much paler throughout.

In addition to these the following species were also secured:—

Euxoa spinifera, Hüb.—Three females and one male; Bir Victoria, March 4th to 5th, 1903. Differing somewhat from the ordinary form in having the claviform stigma rather shorter, and not filled up with black.

Oxicesta chabordis, Oberth.—One male; Bir Victoria, March 4th, 1903.

Cerocala insana, H.-S.—One male and two females; Bir Victoria, March 5th, 1903.

NOTES ON *GEOMETRA VERNARIA*.

By G. M. RUSSELL, B.Sc.

HAVING recently bred from the egg-state a series of *G. vernaria*, I have thought that a few notes on the life-history of the species may be interesting. A worn female, taken in July of last year, having been placed with a few leaves of *Clematis vitalba* in a box, deposited eggs on the 25th of that month. The greenish-yellow eggs were laid on the leaf stems, and were placed one on the other, forming perfect cylinders standing out perpendicularly to the stems. The batches contained from two to eight eggs, which are remarkable for their geometrical accuracy, having perfectly plane ends at right angles to the curved sides. A cylinder of six eggs was about 2 mm. high; each egg was, therefore, a right cylinder about $\frac{1}{3}$ mm. high, and of cross section elliptical; major axis about .8 mm., minor axis .6 mm.

The larvæ emerged on August 9th, without displacing the egg-shells from the cylindrical arrangement, the holes through which they made their exit being in the curved sides, and, in any cylindrical batch, nearly along a generating line. The larvæ were pale green in colour, and fed very slowly. About the middle of September, when they had attained a length of 1 cm., they became very sluggish, only fed on warmer days, and began to change in colour, the rather bright green gradually giving place to a dark brown—i.e. the same colour as the dry stalks to which they attached themselves in the usual geometer manner, and were then only distinguishable with difficulty. They remained in this way the whole winter without movement, although if brought into a warm room they soon began to show signs of life. They were first supplied with food on March 12th. Two or three ate very sparingly, but were again quiescent during cold weather. On April 18th a green tinge was observed at the two extremities of the most advanced larva. This colour-change gradually spread from segment to segment, until by May 5th this larva had become wholly green, and by the middle of May all the larvæ had returned to their original bright green colour. They now fed regularly, although mostly at night, when they were more active. On May 30th they began to spin up, drawing together two or three leaves of the food-plant, fastening them with a few strong threads, and pupating in the space so formed.

Larva:—Length, when full-fed, 29 mm. Head dark red-brown, cleft at top; face paler. Second segment cleft, forming two prominent pointed protuberances. General colour green. An obscure pale dorsal line formed by a number of white dots; a spiracular line, a narrow median line underneath, and another between this and the spiracular line, all formed by white dots.

A black or dark brown oblique streak on tenth segment below spiracles. Spiracles reddish.

The pupa is attached by the tail to one of the smaller stems. Length 13 mm. Deep green at head, shading off to pale green at tail. The pupal coverings of the antennæ are very black and well defined. Three days before the moth emerges the pupal wing-cases become paler, until almost white. The day before emergence they become darker in colour, until of a very dark bluish green. The first moths emerged on July 2nd, and all were out by July 19th.

A curious fact respecting the female of this species was noticed. Four females were placed in a glass-covered box, with a few leaves of *Clematis*, in order to obtain eggs. On removing the glass on July 16th, in order to examine the eggs, a powerful scent was at once noticed. This scent may be described as resembling that in the neighbourhood of pine woods, and, although not unpleasant, was strong enough to be rather sickly and objectionable when the face was held immediately over the box and its contents. In order to definitely settle whether this scent was caused by the moths, a female was taken off the setting-board and the body opened: the same strong scent was at once recognised. It is possible that this scent may serve to attract the other sex, as is stated to be the case with *Hepialus hectus*. I do not remember seeing any previous record of this peculiarity of the female, nor of the seasonal change of colour of the larva.

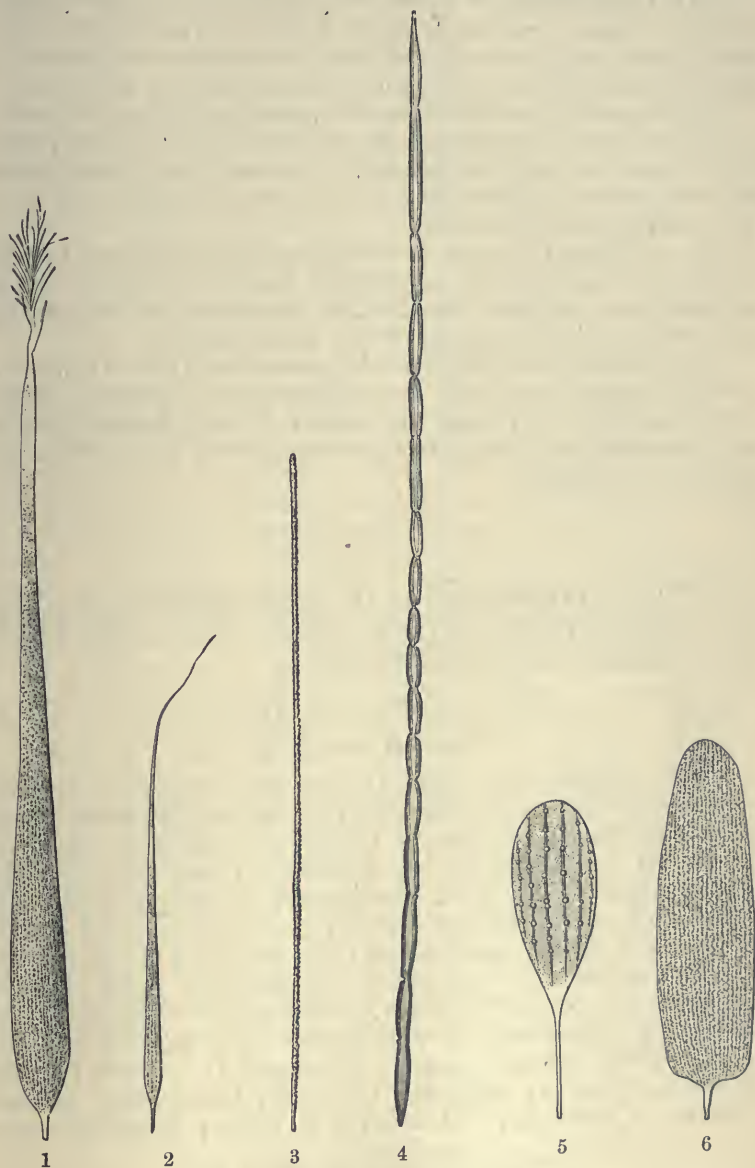
Portchester, Hants: July 19, 1903.

NOTES ON THE PLUMULES OF BUTTERFLIES.*

IN the males of many Lepidoptera, especially butterflies, we find very remarkable scales, quite different from the ordinary scales, which are called plumules. These scales are either spread over the upper side of the wings among the ordinary scales, or are crowded together over a circumscribed space, and form conspicuous velvety and sometimes raised spots, called brands. Some think that these scales have an attractive odour, which draws the female to its own mate; but this is not yet absolutely proved. However, it is known that many butterflies and moths, both males and females, emit a peculiar scent. The principal forms of plumules which are found in the scales of butterflies are represented in the accompanying figures, and are the following:—

* Translated from Prof. C. Aurivillius's 'Nordens Fjärilar' (Stockholm, 1888-1891, pp. viii, ix), by W. F. Kirby.

(1.) Tufted Plumules (*Plumulæ penicillatæ*), which are expanded at the tip into a tuft of small fine bristles (*Encis jutta*).



These are either more or less black, as in the *Satyrinæ* and *Argynnis*; or are uncoloured, as in the *Pierinæ*.

(2.) Bristle Plumules (*Plumulæ subulatæ*) (*Syrichthus malvæ*),

which have the end produced into a single bristle; this is found in the costal fold in *Syrichthus*.

(3.) Hair Plumules (*Plumulæ capillares*) (*Thanaos tages*). These are slender, almost as fine as a hair, and are obtuse at the end. Such plumules are found in the costal fold of *Thanaos tages*, and on the upper side of the wings in many species of *Lycæna*.

(4.) Jointed Plumules (*Plumulæ articulatae*) (*Hesperia comma*), which are slender, nearly smooth, and divided into many joints, easily separable from one another. These very remarkable scales are found closely packed together in the small male-brands in all the species of true *Hesperia*.

(5.) Bladder Plumules (*Plumulæ papillosæ*) (*Lycæna icarus*). These are small oval or egg-shaped scales, which have more or fewer rows of small bladder-like elevations on the surface, and are found in most species of the genus *Lycæna*.

(6.) Dotted Plumules (*Plumulæ punctulatae*) (*Thecla w-album*). Dotted plumules are very like ordinary wing-scales, and the whole surface is very finely and closely dotted; they are always agglomerated into brands, and are found in the species of *Thecla* and in *Colias edusa*.

ON THE NOMENCLATURE OF THE GENERA OF THE RHYNCHOTA; HETEROPTERA AND AUCHENOR- RHYNCHOUS HOMOPTERA.

By G. W. KIRKALDY, F.E.S.

(Continued from p. 216.)

1843. GUÉRIN, Rev. Zool. 112-4. (α) *Peltopterus* t. *rugosa*.
²⁴AMYOT & SERVILLE, H. N. Ins. Hém. 1-676, and i-lxxvi. (α)
Cantao t. *dispar* (= *ocellatus*); *Eucorysses* t. *pallens* (= *grandis*);
Irochrotus t. *maculiventris* (= *lanatus*); *Hotea* t. *triangulum*
(= *gambiæ*); *Coptochilus* t. *ferrugineus*; *Ancyrosoma* t. *alboline-*
atus; *Bolbocorist* t. *tricolor* (= *rufus*); *Tarisa* t. *flavescens*; *Hetero-*
crates t. *coracinus* (= *marginatus*); *Strombosoma* t. *unipunctatum*;
Cazira t. *verrucosa* (= *chiroptera*); *Platynopus* t. *varius* (= *mela-*
noleucus); *Catostyrax* t. *catena*; *Picromerus*²⁵ t. *bidens*; *Lobo-*
*stoma*²⁶ t. *giganteum*; *Zicrona* t. *cœrulea*; *Hiverus* t. *hirtus*
(= *torridus*); *Adrisa* t. *nigra*; *Brachypelta*²⁷ t. *tristis*; *Cyrto-*
menus t. *castaneus*; *Amblyottus* t. *dufouri*; *Dismegistus* t. *circum-*
cinctus (= *fimbriatus*); *Menaccarus* t. *piceus*; *Pododus*²⁸ t. *or-*

²⁴ Probably issued very early in 1844.

²⁵ Homot. *Cimeæ*, 1758.

²⁶ Preocc. Gundl. 1840.

²⁷ Homot. *Cydnus*, 1803.

²⁸ Preocc. Agassiz, 1843.

bicularis; *Dalpada* t. *aspera*; *Mustha* t. *serrata* (= *spinosula*); *Brochymena* t. *serrata* (= *quadripustulata*); *Thelima*²⁹ t. *complanata*; *Nevroscia*³⁰ t. *grata* (= *nubila*); *Bathycœlia* t. *bunopoziensis*; *Menipha*³¹ t. *brunnea* (= *marginatus*); *Oxyrhinus*³² t. *subsulcatus* (= *reticulare*); *Rachava*³³ t. *orbicularis* (= *tristis*); *Sachana*³⁴ t. *depressus*; *Sephela* t. *linearis*; *Mormidea* t. *ypsilon*; *Myrochea* t. *vittata* (= *aculeata*); *Loxa* t. *flavicollis*; *Galedanta* t. *bituberculata*; *Oœdosoma*³⁵ t. *acroleucum*; *Zalega* t. *furcifrons*; *Nezara* t. *smaragdula* (= *viridula*); *Evoptilus* t. *laciniatus*; *Sastragala* t. *uniguttata*; *Taurocerus* t. *edessoides* (= *achillès*); *Peromatus* t. *notatus*; *Dorypleura* [= *Edessa*, 1803], t. *bubalus*; *Hypoxys* [= *Edessa*] t. *quadridens*; *Pygoda* [= *Edessa*] t. *polita*; *Aceratodes* [= *Edessa*] t. *cruentus* (= *rufomarginatus*); *Brachystethus* t. *marginatus*; *Piezostemum* t. *mucronatum* (= *subulatum*); *Mucanum* t. *canaliculatum*; *Hypencha* t. *apicalis*; *Mattiphus* t. *carrenoi* (= *laticollis*); *Eurypleura* t. *bicornis*; *Dalcantha* t. *dilatata*; *Pycanum* t. *amethystinum* (= *rubens*); *Cyclopelta* t. *obscura*; *Placosternum* t. *taurus*; *Dalsira* t. *affinis*; *Diplorhinus* t. *furcatus*; *Macrina* t. *furcata* (= *juvenca*); *Gonopsis* t. *denticulata*; *Diploxys* t. *senegalensis*; *Dalader* t. *acuticosta*; *Namacus* t. *transvirgatus*; *Prismatocerus* [= *Homœocerus*, 1835], t. *auritulus* (= *magnicornis*); *Sephima* t. *pustulata*; *Molchina* t. *compressicornis*; *Mozena* t. *spinicrus* (= *brunnicornis*); *Spathophora* t. *biclavata*; *Melucha* [= *Physomerus*, 1835], t. *lineicollis* (= *phyllocnemis*); *Piezogaster* t. *albonotatus* (= *calcarator*); *Petalops* t. *elegans* (= *thoracicus*); *Sundarus* [= *Paryphes*, 1835], t. *neniator* (= *regalis*); *Chœrommatus* t. *farinosus*; *Tetroda* t. *histeroides*; *Enoplops*³⁶ t. *scapha*; *Anasa* t. *cornuta*; *Golema* t. *rubromaculata* (= *histrio*); *Camptischium* [= *Hymeniphora*, 1832], t. *spinosum* (= *clavipes*); *Acanthocoris* t. *scabrator*; *Machtima* t. *crucigera*; *Zoreva* t. *fasciata* (= *dentipes*); *Pephricus* t. *paradoxus*; *Tynotoma* t. *vittata* (= *amicta*); *Meloza* t. *villosipes*; *Zicca* t. *massulata* (= *nigropunctata*); *Beosus* t. *quadratus* (= *luscus*); *Pterotmetus* t. *staphyliniformis*; *Oedancala* t. *dorsilinea* (= *dorsalis*); *Cantacader* t. *quadricornis*; *Anomaloptera* t. *helianthemii*; *Crimia* t. *tuberculata*; *Mezira* [= *Brachyrhynchus*, 1832], t. *granulata* (= *usurpatus*); *Catamiarus* t. *brevipennis*; *Tetroxia* t. *spinifera*; *Acanthaspis* [= *Tetroxia*] t. *sexguttata*; *Physopelta* tt. *erythrocephala*+*affinis* (both = *albofasciata*); *Durganda* t. *rubra*; *Cethera* t. *variata* (= *musiva*); *Salyavata* t. *variegata*; *Beharus* t. *luna-*

²⁹ Homot. *Chlorocoris*, 1837.

³⁰ Homot. *Agonoscelis*, 1837.

³¹ Homot. *Ochlerus*.

³² Homot. *Macropygium*, 1837.

³³ Homot. *Sympiezorhincus*, 1837.

³⁴ Homot. *Coriplatus*, 1843.

³⁵ Homot. *Arocera*, 1837.

³⁶ Homot. *Coreus*, 1803.

tus (= *cylindripes*); *Trichoscelis*³⁷ t. *stollii* (= *flavicans*); *Micrauchenus* t. *lineola*; *Ponerobia* t. *rubronotata* (= *bipustulata*); *Herega* [= *Apiomerus*, 1832,] t. *rubrolimbata* (= *crassipes*); *Pristhevarma* t. *bipunctata*; *Cidoria* t. *flava*; *Yolinus* t. *sufflatus*; *Eulyes* t. *amœna*; ³⁸ *Sycanus* t. *collaris*; *Pristhesancus* t. *dorycus*; *Helonotus* t. *tuberculatus* (= *sexspinosus*); *Piezopleura*³⁹ t. *angulosa*; *Montina* t. *sinuosa*; *Acantischium* t. *maculatum*; *Isocondylus* t. *elongatus*; *Darbanus* t. *nigrolineatus* (= *plagiatus*); *Passaleutes* t. *geniculatus*; *Saica* t. *rubella*; *Atrachelus* t. *heterogeneus* (= *cinereus*); *Heza* t. *binotata*; *Sava* t. *coronota* (= *tuberculata*); *Sphæridops* t. *amœnus*; *Sastrapada* t. *flava*; *Canthesancus* t. *trimaculatus*; *Rhaphidosoma* t. *burmeisteri* (= *major*); *Sciadopterus* (= *Acanthia*, 1775), t. *flavipes*; *Ptilomera* t. *laticauda* [ta]; *Apasus*^{39a} t. *natator*; ^{39b} *Cercotmetus* t. *asiaticus*; *Tacua* t. *speciosa*; *Tosena* t. *fasciata*; *Platypleura* t. *stridula*; *Zammara* t. *tympanum*; *Hymenarcys* t. *perpunctata*; *Pycna* t. *strix* (= *stryx*); *Gæana* t. *maculata*; *Hemisciera* t. *maculipennis*; *Mogannia* t. *illustrata*; *Oxypleura* t. *clara*; *Tettigades* t. *chilensis*; *Cyclochila* t. *australasiæ*; *Dundubia* t. *vaginata*; *Tettigomyia* t. *vespiformis*; *Physoplia* t. *crassicornis*; *Hotinus*⁴⁰ t. *candelarius*; *Lappida* t. *proboscidea*; *Hysteropterum* t. *immaculatum*; *Dalapax* t. *postica*; *Pochazia* t. *fasciata*; *Colobesthes* t. *falcata*; *Phyllyphanta* t. *producta*; *Phalænomorpha* t. *incubans*; *Nephesa* t. *rosea*; *Encophyllum* t. *cruentatum*; *Enchenopa* t. *monoceros*; *Notocera* t. *cruciata*; *Bolbonota* t. *nisus*; *Gargara* t. *genistæ*; *Thelia* t. *bimaculata*; *Nessorhinus* t. *vulpes*; *Oeda* t. *inflata*; *Uroxiphus* t. *maculiscutum*; *Rhinaulax* t. *maculipennis* (= *analis*); *Triecphora* [= *Tomaspis*, 1843], t. *sanguinolenta*; *Monecphora* [= *Tomaspis*] t. *cingulata*; *Proconia* t. *obtusa*; *Aulacizes* t. *quadripunctata*; *Diestostemma* t. *albipenne*; *Acopsis* t. *viridicans*; *Aglena* t. *ornata* (= *acuminata*); *Epiclines*⁴¹ t. *planata*; *Zennica* t. *flavidorsum*; *Prolobodes* [n. n. for *Lobostoma*, 1843], t. *giganteum*. (β) *Galostha* [= *Chrysocoris*], *Galgupha* [= *Corimelæna*], *Canthecona*, *Sehirus*, *Tritomegas*, *Hyalymenus*, *Camptopus*, *Ectatops*, *Lestomerus*, *Rasahus*, *Therapha*, *Diplodus*,⁴² *Sinea*, *Pothea*, *Plæogaster*, *Saccoderes*, *Zaitha* [= *Belostoma*, 1807], *Huechys*, *Thopha*, *Fidicina*, *Carineta*, *Ceresa*, *Tomaspis*, *Sphenorhina*, *Lepyronia*. (γ) *Arma*, 1832, t. *custos*; *Ciccus*, 1829, t. *adspersus*; *Entylia*, 1833, t. *sinuata*, F.; *Homæocerus* [recte *Homæocerus*, 1835], t. *nigripes*; *Calliphara*, 1839, t. *nobilis*; *Spartocera*, 1832, t. *geniculata*;

³⁷ Preocc. Dej. 1834.

³⁸ Nec *amœna* ut apud Leth. et Sev., &c.

³⁹ Homot. *Harpactor*, 1832.

^{39a} = *Diplonychus*, 1832.

^{39b} = *nepoides*, Fabr.

⁴⁰ Homot. *Pyrops*, 1837.

⁴¹ Preocc. Guér. 1830.

⁴² Preocc. Agassiz, 1843.

Sphærocoris, 1835, t. *ocellatus*; *Stiretrosoma*, 1837, t. *erythrocephala*; *Platycoris*, Guér., 1830, t. *rubromarginatus*; *Rhaphigaster*, 1832, t. *punctipennis*; *Alphocoris* t. *lixoides*; *Hemiptycha*, 1833, t. *punctata*; *Solenostethium* [recte *-sthedium*] t. *lynceum*; ⁴³*Phimodera*, 1839, t. *galgulina*; *Apodiphya* [recte *Apodiphus*, 1837], t. *hellenicus* (= *amygdali*); *Verlusia*, 1837, t. *rhombea* (= *quadratus*); *Paryphes*, 1835, t. *lætus*. (♂) *Maotys*, unnecessary n. n. for *Ptilocerus*, 1840; *Coreomelas* for *Corimelæna*, 1839; *Prooxys*, 1837; *Platymerus*, 1832; *Hymenophora*, 1832; *Metapodus*, 1842; *Placoscelis*, 1837; *Plociomerus* for *Ptochiomera*, 1832; *Lohita* for *Macroceræa*, 1837; *Helicoptera* for *Elidiptera*, 1839; *Doryderes* for *Dyroderes*, 1837; *Phyllochirus*, 1837; *Cladypha* for *Cladodiptera*, 1839; *Hygyops* for *Ugyogs*, 1830; *Physorhynchus*, n. n. for *Loricerus*, Hahn [which is NOT preocc.]; *Metastemma* for *Prostemma*, 1832; *Schizops*, 1837; *Hypsochenia*, 1833; *Achillus*, 1818; *Deropteryx*, 1839; *Acanthischium* [p. 648] for *Acantischium* [p. 367]; *Tlasia*, 1836; *Coryssorhaphis* for *Coryzorhaphis*, 1837.

DESCRIPTIONS OF TEN NEW SPECIES AND NINE NEW GENERA OF ICHNEUMONIDÆ FROM INDIA, CEYLON, AND JAPAN.

By P. CAMERON.

CRYPTINA.

STERIPHOCRYPTUS, gen. nov.

Median segment with two transverse keels, toothed; its spiracles linear; the segment about one-half the length of the mesothorax. Disco-cubital nervure without the stump of a nervure. Transverse median nervure in hind wings broken below the middle. Post-petiole distinctly dilated. Radial cellule large, elongate, the areolet moderate in size, the sides convergent above. Head rounded inwardly in front and behind. Apex of clypeus transverse. Mandibles with two large teeth. Wings large, hyaline. The body is luteous, marked with black; the spiracles of the second abdominal segment are placed shortly behind the middle; the gastrocœli are small, deep, round; the malar space large, the head obliquely narrowed behind the eyes and well-developed there. Tarsi long, spinose; the fourth joint roundly incised. Antennæ stout, dilated towards the apex; the basal joints of the flagellum not much longer than the others. There is a distinct metapleural keel.

The type of this genus is larger and more robust than usual with the Cryptina. In Ashmead's arrangement it comes near *Callicryptus*, Bull. U.S. Nat. Mus. xxiii. 43.

⁴³ Homot. *Cœloglossa*, 1839.

STERIPHOCRYPTUS LUTEUS, sp. nov.

Luteous; the sides of the mesonotum, the base and apex of the metanotum, the base of the meso- and metapleuræ and of the abdominal segments, black. Wings hyaline, with a yellowish-fusca tinge; the nervures blackish; the stigma dark testaceous. Antennæ pale yellow, blackish towards the apex. ♀. Length 15 mm.

Hab. Darjeeling.

Face and clypeus closely punctured, as is also the front; the latter is furrowed in the centre; the centre of the vertex of the front and occiput are rufous in colour. Mandibular teeth black. Mesonotum closely punctured; the furrows are distinct, deep on its basal half. Median segment closely and somewhat strongly punctured; its basal transverse keel is interrupted in the centre. There is an oblique keel above the centre of the propleuræ. The tooth on the metanotum is broad. The transverse cubital nervures converge above; the second is widely bullated, it being only indicated at the top and bottom. Abdomen smooth and shining.

PHYGADEUONINI.

LINYCUS, gen. nov.

Metathoracic spiracles small, oval, distinctly longer than broad; its areola longer than broad, widely separated from the base of the segment. Clypeus distinctly separated from the face, its apex broadly rounded. Malar space large. Mandibles stoutly bidentate. Temples broad. Scape distinctly smaller than the first joint of the flagellum. Scutellum flat, keeled laterally at the base. Mesosternum bordered on its basal half by a deep furrow. Areolet 5-angled; the transverse basal interstitial; the transverse median nervure in hind wings broken far below the middle; the stigma is longish; the radius originates from its middle, the transverse median nervure is interstitial. Abdomen long and slender, flat above, the post-petiole distinctly bent; the last two segments with large pale membranous depression; the last segment bluntly pointed; the ovipositor projects; its sheaths are broad. The spiracles on the first segments are placed close to the apex; there are distinct depressions (gastrocelli) on the base of the second segment; the post-petiole is not keeled. The legs are moderately stout; the basal joints of the flagellum are greatly elongated; the parapsidal furrows are indistinct; the posterior median area is not separated; there are no teeth on the median segment; the abdomen is longer than usual, being longer than the head and thorax united; its second segment is as long as the petiole, and is twice longer than wide; the disco-cubital nervure is angled near the middle, but not broken.

Belongs to the Phygadeuonini, and comes, in Ashmead's table, close to Panargyrops.

LINYCUS RUFIPES, sp. nov.

Black; the median segment and the middle of the post-petiole red; the face except in the centre, clypeus, the mandibles except at the apex, the inner orbits from opposite the base of the antennæ, a

broader band round the top of the eyes, the lower two-thirds of the lower outer orbits, the upper and lower edge of the propleuræ, the tubercles, the lower half of the mesopleuræ, the tegulæ, an irregular mark on the centre of the mesonotum, the scutellum and post-scutellum, pale yellow. There is a curved pale yellow mark on the base of the second segment, there is a narrow yellow line on its apex, a narrower one on the base of the third, and a semicircular mark—the base rounded, the apex transverse—on the fifth and sixth segments, pale yellow. Legs rufous, the four front coxæ and trochanters pale yellow; hinder coxæ black, with a yellow line in the centre above; the hinder trochanters, apex of tibiæ and tarsi blackish. Wings hyaline; the nervures blackish; the stigma testaceous. ♀. Length 6 mm.

Hab. Trincomali, Ceylon (Col. Yerbury).

Face closely, the clypeus sparsely in the centre punctured; the front and vertex more strongly punctured, with a small smooth curved spot on the top of the front. Thorax closely punctured; the scutellum and post-scutellum smooth; the base of the median segment and the areola smooth; the apical slope of the segment closely transversely striated, the centre with the striæ more distinct and more clearly separated than they are on the sides. The large central part of the post-petiole is raised and clearly separated from the more depressed sides; its apex is obscure yellow; the second and third segments are shagreened; the others smooth and shining.

JOPPINI.

LORTYGIA, gen. nov.

Antennæ thickened and dilated at the apex. Scutellum not much raised above the mesonotum, its sides distinctly keeled to near the apex. Base of median segment widely depressed; the areola large, obliquely narrowed towards the base, which is closed, and is widely separated from the base of the segment, to which it is not united by a petiolar area; the segment is completely areolated and bluntly spined on the sides. Areolet 5-angled, wide above; the disco-cubital nervure with a stump; the transverse median nervure is received very shortly behind the transverse basal. Malar space large, as long as the scape of the antennæ. Apex of clypeus transverse; the clypeus projecting. Petiole long and slender; its apical third becoming gradually wider to the apex, the post-petiole not being clearly separated, and smooth and shining. Gastrocœli indistinct, bordered on the outer side by a deep, clearly defined furrow; the segments smooth. The male has the antennæ serrate; the ventral fold is on the second and third segments. The body is rufous in colour, with hyaline wings; the tarsi are much longer than the tibiæ; both are sparsely and weakly spined; the apices of the tarsal joints more thickly than the rest of them. Metathoracic spiracles linear. The abdomen in the male has seven segments; the last large, bluntly pointed, as long as the preceding. There is a stout oblique keel behind the middle of the propleuræ.

This genus appears to be intermediate between the Joppini and the Amblypygi. From its more completely areolated metathorax, it may be referred to the latter. The apex of the abdomen

in my female specimen is broken off; but in the male it is twice the length of the thorax. The body is for the greater part rufous, with the apex of the abdomen black; the wings are unspotted. The characteristic features are the keeled scutellum, the areola longer than wide and broadly rounded behind, the long slender abdominal petiole, and the long, deep, narrow gastrocœli.

LORTYGIA RUFA, sp. nov.

Rufous; the four apical segments of the abdomen, an oblique line below the middle of the propleuræ, a similar line below the fore wings, one on the lower half of the apex of the mesopleuræ, the depressions round the scutellum, the greater part of the base of the median segment and the apex of the posterior median area largely, black; the antennæ rufous, the apex broadly black; the wings hyaline, with a slight fulvous tinge; the stigma dark testaceous; the nervures blackish. ♀ and ♂. Length 13 mm.

Hab. Khasia Hills (coll. Rothney).

Face closely, the clypeus more sparsely punctured; the vertex and front are more closely punctured; the eye orbits are pallid yellow, the inner above sharply margined. Mandibles black at the apex. Scutellum more sparsely and strongly punctured than the mesonotum. Except in the centre at the base and on the sides of the areola, the median segment is closely and distinctly and rather strongly punctured. Petiole smooth; the second and third segments closely punctured; the gastrocœli obsolete; the base of the segment closely punctured like its centre. The fourth abdominal segment may be black, wholly or in part.

CALLAJOPPA, gen. nov.

Scutellum pyramidal, with a long oblique apical slope. Basal depression of the median segment wide and deep; the areola small, smooth, and shining, rounded behind and not margined there; the apex transverse; there are five apical areæ, all clearly defined, this being also the case with the spiracular. Labrum projecting. Apex of clypeus transverse, its foveæ deep. Antennæ stout; the third joint not much longer than the fourth. Areolet 4-angled, the nervures touching on the top; the disco-cubital nervure with a large stump of a nervure; the transverse median nervure not interstitial, being received shortly beyond the transverse basal. Abdomen not much longer than the head and thorax united; with eight segments, the last small and with large cerci; the apex of the abdomen broad and bluntly rounded; the segments minutely punctured, almost smooth and distinctly shining.

Comes close to *Dimætha*, which has a similarly formed median segment and smooth, not margined, small areola; but it may be known from the present genus by the scutellum not being pyramidal, by the abdomen being longer and narrower, by the wings being clouded at the apex, by the disco-cubital and recurrent nervures not being broken by the stump of a nervure. *Erythrojoppa* is also nearly related; its occiput is sharply keeled; the

abdomen longer and narrower, with the segments punctured and striated, the temples more sharply obliquely narrowed, straight, not rounded, as in the present species.

CALLAJOPPA BILINEATA, sp. nov.

Rufo-testaceous; the mesonotum, except for two lines in the middle, the pleuræ, the metanotum, except at the base, the fourth and following segments of the abdomen and the greater part of the hinder coxæ; the centre of the front and vertex and the greater part of the occiput, which are black; the antennæ of a more yellowish paler colour, with the apex black; the wings hyaline, with a distinct yellowish tinge; the stigma testaceous; the nervures darker. ♀. Length 24 mm.

Hab. Japan.

Face and base of clypeus punctured; the vertex more sparsely punctured; the depressed front smooth and shining; the ocellar region projects into its centre as a sharp-point wedge. Mesonotum closely and uniformly, but not strongly, punctured; its sides depressed and rufous; the scutellum almost impunctate. Median segment coarsely, closely, transversely striated, except at the base, which is finely rugose; the pleuræ are coarsely obliquely striated. Pro- and mesopleuræ more strongly and closely punctured than the mesonotum; the depression and apex of the propleuræ striated. The petiole is depressed in the centre, the sides being distinctly raised, forming stout keels; the centre of the post-petiole is depressed, the depressed part being finely longitudinally striated. Gastrocoeli deep, smooth, with a few striæ above on the inner side; the space between them is not striated.

AMBLYPYGI.

PLATYLABUS FERRUGINEUS, sp. nov.

Ferrugineous; the eye orbits, the base of the propleuræ, and the tubercles pale yellow; wings hyaline; the nervures and stigma black; the flagellum of the antennæ blackish from behind the middle. ♀. Length 5 mm.

Hab. Trincomali, Ceylon (Yerbury).

Head closely punctured; the face more strongly than the front or vertex; the apex of the clypeus and the labrum smooth. Thorax closely punctured; the scutellum more shining and only sparsely and indistinctly punctured. Areola longer than broad, open behind, its apex transverse; aciculated; the posterior median area almost smooth, its base obscurely striated; the other areæ are more closely and strongly punctured; the sides in the middle bear a short spine. Petiole aciculated; the other segments are more distinctly punctured. Gastrocoeli shallow. Areolet 4-angled; the nervures uniting above; the lower side angularly projecting below the cubitus.

HALIPHERA, gen. nov.

Scutellum roundly convex. Median segment longish, its apex with a rather steep slope, its sides toothed; the areola large, fully twice longer than broad, open at the base and apex. Abdomen longer

than the head and thorax united; with eight dorsal segments; on the back they are rather flat; gastrocœli small, the space between not striated. Ventral fold on the third and fourth segments. Tarsi covered thickly with pubescence and more sparsely spined. The antennæ are stout, compressed beyond the middle and broadly ringed with white. Apex of clypeus transverse; it is not separated from the face. Labrum hidden. Hypopygium large, cultriform, but not covering the terebra. Apical two segments spotted with yellow.

May be known from *Amblyteles*, to which it is most closely related, by the longer median segment, with its longer areola, and by the distinctly roundly convex scutellum.

HALIPHERA MACULIPES, sp. nov.

Black; the sides of the clypeus, the face, except in the centre, the inner orbits—broader above than below—the lower half of the outer, the palpi, a broad band, obliquely curved below, on the edge of the pronotum, the lower part of the propleuræ behind, a mark on the middle of the mesonotum, the scutellums, the middle of the median segment—the mark narrowed above, rounded below—the tubercles, a large mark on the middle of the mesopleuræ—narrowed gradually and rounded behind—a large oval mark on the metapleuræ, the post-petiole, a mark on the sides of the second and third segments, a small mark on the top of the penultimate, and the whole of the last segment, bright lemon-yellow. Legs yellow; the four front femora above, the base of the lower part of the hind coxæ, the trochanters, the basal and apical third of the hinder femora, and the apex of the tibiæ, black. Wings hyaline; the stigma brown; the nervures darker. Scape of antennæ yellow in the middle below; the middle of the flagellum with a broad white band. ♀. Length 13 mm.

Hab. Darjeeling.

Face closely, the clypeus much more sparsely, punctured, and thickly covered with short white pubescence. The upper part of the front in the centre transversely, irregularly striated; the lower part of the ocellar region obliquely, the vertex behind the ocelli closely striated. Mesonotum closely rugosely punctured, the scutellum smooth. Median segment closely rugosely punctured at the base; the sides from near the apex of the spiracles transversely reticulated; the sides of the apical slope widely and irregularly reticulated; the spiracular area below the spiracles stoutly obliquely striated; the teeth stout, bluntly rounded. Pleuræ closely punctured. Abdominal petiole to near the apex aciculated and sparsely punctured; the post-petiole almost smooth in the centre, the sides distinctly, but not closely punctured; the basal half of the second segment finely and closely striated. Gastrocœli deep, smooth.

HARSACES, gen. nov.

Scutellum flat, its sides at the base keeled to the middle. Areola twice longer than broad, its basal half narrowed, the keels there curving roundly inwardly and not quite reaching to the base. Post-petiole longer than the narrowed basal part, three times its width, the central part clearly separated. Metathoracic spiracles three times

longer than wide. Gastrocoeli deep. The ventral fold projects outwardly on the second to fourth segments, forming a broad margin along the lower edge. Areolet 5-angled; the nervures wide apart above. Fore tarsi with some spines. The abdomen is bluntly pointed at the apex; its back is roundly convex; the temples broad, the mandibles broad, bidentate—the middle area of the post-petiole is clearly separated and for the most part smooth.

Comes near to *Platylabis*, from which it may be known by the flat scutellum, much larger and longer, compared with its width, areola, and by the large, broader, and more distinctly separated petiole.

HARSACES NIGRIPES, sp. nov.

Black; densely covered with white pubescence; the second and third abdominal segments red; the inner eye orbits, sides of clypeus, and two marks on the apex of the scutellum pale yellow; the fore tibiæ slightly testaceous; the wings hyaline; the nervures and stigma black. ♀. Length 7 mm.

Hab. Himalaya.

Antennæ black, covered with a microscopic pile. Face and clypeus closely, strongly, and uniformly punctured; the front and vertex are, if anything, more closely punctured. Apical half of mandibles rufopiceous. Maxillary palpi pale yellow. Thorax closely, uniformly, and distinctly punctured; the punctures on the scutellum are more widely separated. Areola smooth; its edges depressed. Calcaria white. The middle and apex of the central area of the post-petiole are smooth; the rest of the segment and all the others closely punctured.

OXYPYGI.

TAPHANES, gen. nov.

Areola not separated behind, large, roundly contracted in the middle, separated from the lateral areæ. Abdomen with eight segments; the post-petiole clearly separated; gastrocoeli deep; the last segments sharply pointed; sheaths of the ovipositor largely projecting; the ventral keel distinct on the second and third segments only. Antennæ stout, dilated beyond the middle. Labrum visible. Scutellum flat. Areolet 5-angled, narrowed above; the disco-cubital nervure with the stump of a nerve. Legs short and stout; the tarsi spinose.

Belongs to the Oxypygi. May be known by the largely projecting sheaths of the ovipositor, and by the large areola open behind, and roundly narrowed in the middle. The temples are of moderate size; the occiput is roundly incised; the post-scutellum bifoveate at the base; the apex of the median segment has a gradually rounded slope. In Ashmead's arrangement this genus would come near *Exephanes*.

TAPHANES RUFIVENTRIS, sp. nov.

Black; the outer and inner orbits, the face, clypeus, labrum, a triangular mark on the base of the mandibles, palpi, a line on the apical two-thirds of the pronotum, two lines in the middle of the mesonotum,

the scutellum, except for a black line, widest on the basal half, in the centre, the post-scutellum, an oblique mark, widest on the lower half, on the sides of the metanotum at the apex, the tubercles, the lower half of the mesonotum, and a large mark on the metapleuræ, below and touching the keel, yellow. Antennæ black, the middle whitish, the apex fuscous, the scape yellow below. The four front legs are pallid yellow, the femora and tibiæ broadly marked with black behind, the femora tinged with rufous above, the hinder coxæ black, broadly yellow at the apex above and more narrowly at the apex below, the trochanters yellow, the basal half of the hinder femora, the apical half, as are also the tarsi, black. Wings hyaline, the stigma fuscous. Abdomen rufous, the petiole and the apical two segments black, the apex of the petiole yellow. ♀. Length, 11 mm.

Hab. Darjeeling.

Face and clypeus, except the latter at the sides, punctured; there is a deep furrow outside the hinder ocelli; the occiput is sharply margined. Mesonotum punctured, but not very closely or deeply; the scutellum sparsely punctured. Base of median segment aciculated, the keels indistinct; the apical three areæ are distinctly defined and closely and coarsely punctured, as is also the spiracular. The centre of the post-petiole is longitudinally punctured; the gastrocœli deep, smooth, except for some striæ at the base; the space between is longitudinally striated to near the end of the segment. Pleuræ closely punctured; the apex of the pro- obliquely and somewhat irregularly striated. Post-petiole strongly punctured throughout, as are also the other abdominal segments. Tarsi longer than usual. The ventral keel extends on to the fifth segment; the last abdominal segment is bluntly rounded; the second and third segments, and to a less extent the fourth, are closely striated; there are seven segments, the last being nearly as large as the preceding. Metanotum short; the areæ, with the exception of the areola, punctured, the basal less strongly than the others; all the areæ, including the petiolar, are distinctly defined.

LEPTOTHECUS, gen. nov.

Median segment large, distinctly longer than broad, its apex spined, and with a somewhat steep, not rounded, slope; the areola coffin-shaped, open at the base, elongate, fully three times longer than broad, transverse at the apex. Scutellum flat. Apex of clypeus broadly transverse. Labrum projecting. Antennæ broadly ringed with white, not much dilated beyond the middle. Abdominal petiole long and slender, becoming gradually, but not much, wider towards the apex; there are seven segments; the last is large, two-thirds of the length of the penultimate; the sheath of the ovipositor largely projecting, as long as the apical two segments united; the ventral fold not defined. Areolet 5-angled, narrowed above; there is a stump of a nervure on the disco-cubital. Tarsi spinose; the hinder tibiæ narrowed at the base. The thorax is longer than usual; with the head it is as long as the abdomen. The latter becomes gradually narrowed from the base of the fourth segment; the last two segments are marked with white. Hinder legs much longer than the others.

Belongs to the Oxypygi. May be known by the elongated

spined median segment, with its elongated coffin-shaped areola, confluent with the lateral areæ at the base; by the long projecting ovipositor; and by the smooth impunctate abdomen, with its small gastrocoeli.

(To be continued.)

NOTES AND OBSERVATIONS.

PARASITES ON LARVÆ OF *MACROTHYLACIA RUBI*.—On the 17th of July I found the young larvæ of *Macrothylacia (Bombyx) rubi* very plentiful on the South Downs, resting at full length on the stems of grass. On several of those I took home I noticed what I imagined to be eggs of some parasitic fly, the kind one often finds on larvæ. Having many times successfully reared the perfect insect from larvæ from which I had removed such eggs, I started on these and destroyed them with a pair of pliers. One or two of these caterpillars had four or five attached to them, favourite spots being at the side of the head and on the base of the claspers. Just as I was dealing with the last it fell off the larva, and as I was about to squash it as it lay at the bottom of the box, I was surprised to see it commence crawling. I at once captured it and examined it through a microscope, using a low power, and found it to be, I believe, the larva of a mite. The following is a description:—Colour light reddish brown. Body oval, a shade broader posteriorly, very shiny and sparsely covered with straight black bristles, coarse and blunt. Legs six in number, and, like the body, sparsely covered with black bristles, but much finer and shorter. In front and behind each of the front legs is a rather long curved bristle, unlike the others, as it gets finer towards the end. Rostrum and palpi very prominent, attached to the body by a slender and very flexible neck. Rostrum long, pointed, and, I think, slightly curved downwards. Palpi not so long. On the 5th of this month I again went to the downs, took a dozen more larvæ, and found them all quite free from these little crawlers. I have never found larvæ attacked in this way before, and would like to know whether it is a common occurrence.—J. T. BIRD; The Lodge, Cowfold, Sussex, Aug. 17th, 1903.

SMERINTHUS POPULI DOUBLE-BROODED.—From about one hundred ova of *S. populi*, which started to hatch about May 28th, I obtained about fifty larvæ. These commenced to pupate on June 23rd, and by June 30th all had gone down. I did not disturb the pupæ, but on Aug. 12th utilised the cage containing them for some larvæ of *S. ocellatus*. I looked in the cage to-day (Aug. 14th) to see if the *S. ocellatus* larvæ required fresh food, and observed, just by the head of one of the larvæ, about a dozen pale green eggs on the willow twig. Closer examination disclosed thirteen *S. populi*, five males and eight females, the males being all dead, and most of the females busily engaged ovipositing. The larvæ from which these imagines resulted were reared under conditions in no way tending to produce this remarkable result;

as soon as they were about half an inch long I sleeved them on poplar (out of doors), and there they remained till ready to go down. I then enclosed them in a breeding-cage, which was kept out of doors until I discovered that the moths had emerged. The imagines are smaller and darker than the first brood.—B. STOVELL; 25, Studley Road, Clapham, S.W.

YELLOW COLOURING OF COCOON OF *PLUSIA MONETA*.—As Mr. Bird's theory is disputed by Mr. Smallman (*ante*, p. 217), I should like to say that, having had *P. moneta* cocoons for several years, I have always found that moisture had the effect of turning the cocoons bright yellow. This first occurred to my notice through sprinkling water on the cocoons with a hair-brush. When I next inspected them they had turned bright yellow. Permanent white cocoons have not come under my notice, but of course there may be such. *P. moneta* is now very common, and anyone can make the experiment with the hair-brush.—A. ROBINSON; Bretanely, Chislehurst, Aug. 4th, 1903.

Mr. Smallman does not mention having tried the effect of water on the "permanent white cocoon." If he has, and found that it did not turn the fabric yellow, it would be interesting to know whether the cocoon experimented upon was a fresh one or not. It may be that the colour-producing element in the silk deteriorates with age, and in an old enough cocoon ceases to be affected by moisture.—J. F. BIRD; The Lodge, Cowfold, Sussex, Aug. 4th, 1903.

CAPTURES AND FIELD REPORTS.

GYNANDROUS *HESPERIA ACTÆON*.—On July 16th last I took, near Swanage, a very good specimen of the above, the left side having male markings and the right side female. The specimen is now in the collection of Sir Vannery Crewe, Bart.—A. FORD; "Hillside," Sunnyhill Road, Pokesdown, Hants.

PLUSIA CHRYSITIS IN SOUTH LONDON.—*Plusia chrysitis* came into my study to the light last week; first time I have taken this insect so near London. *Triphana ianthina* has also been a visitor.—W. DANNATT; 75, Vanburgh Park, Blackheath, Aug. 17th, 1903.

PIONEA (EBULEA) STACHYDALIS IN SURREY.—Last year I recorded this species from the Esher district (*Entom.* xxxv. 244). On July 25th last I captured a rather worn specimen at Byfleet.—RICHARD SOUTH; 96, Drakefield Road, Upper Tooting, S.W.

DEILEPHILA LIVORNICA AT BOURNEMOUTH.—It is with pleasure that I forward a record of the capture of *D. livornica*. On March 27th last my daughter was fortunate enough to find a large "hawk" at rest on the rough grass, on the East Cliff at Bournemouth. She took it to a chemist, by whom it was unskilfully killed and rather rubbed, though it is still in very fair condition. In the journey home the luggage was unfortunately lost, and only after some months was the bag containing

the insect recovered, so that I have only now been able to identify it. When found it was in absolutely perfect condition, and apparently just emerged. Does not this look as though it had been bred on British soil?—(Rev.) A. NASH; Standish Vicarage, Stonehouse, Glos.

ARCTIA CAIA, YELLOW VAR.—For the last few years I have collected innumerable larvæ of *A. caia*, with the hope of breeding the yellow variety, but have never been successful. To-day, however, Nature herself has supplied me with the variety, which breeding in captivity failed to do. I found the specimen—a female—lying upon its back on a garden path, having been disabled apparently by a bat, although it is practically none the worse as far as condition is concerned. It was by pure accident I picked it up, for I was quite unaware of the aberration of the moth until I reached home some little time after.—F. G. BELLAMY; Ringwood, Aug. 5th, 1903.

LEPIDOPTERA AT ELECTRIC LIGHT.—I thought the following list of insects, taken by myself and friends in this neighbourhood (South Norwood), might be of interest, being so near to London. They were all taken on four visits during the first and second weeks in July last:—*Cossus ligniperda* (8), *Zeuzera æsculi* (3), *Acronycta leporina* (2), *Earias chlorana* (1), *Plusia gamma* (5), *P. moneta* (2), *P. chrysis* (1), *Smerinthus populi* (2), *S. ocellatus* (1), *Mamestra persicariæ* (20), *Amphidasys betularia* (20), including five very fine dark specimens, closely approaching var. *doubledayaria*; *Leucoma salicis* (2), *Uropteryx sambucaria* (a nuisance), *Dicranura vinula* (1), *Acronycta aceris* (4), *A. megacephala* (in plenty), *Axylia putris* (2), *Noctua plecta* (2), *Spilosoma menthastri* (3), *Pterostoma palpina* (1), *Epione apiciaria* (1), *Rumia cratagata* (in plenty), *Mamestra brassicæ* (3), *Bryophila perla* (2), *Dipterygia pinastris* (*scabriuscula*) (2), *Apamea ophiogramma* (1), *Cucullia umbratica* (1), *Eupithecia centaureata* (1), *Caradrina morpheus* (5), *C. blanda*? (2), and *Mania maura* (1). I have never heard of the last-named being taken quite so early before (July 3rd).—A. J. LAWRENCE, Anerley.

SUMMER NOTES (1903) FROM THE SALISBURY DISTRICT.—The following notes date from May 20th to the beginning of August. Thanks to the fickle weather and my work, I was unfortunately unable to do nearly as much collecting as I should have liked, and my captures, although including many interesting species, can in no way be considered representative of the lepidopterous fauna of the district. The country around Salisbury certainly looks very promising for entomology. There is so much variety—the chalk-downs, the marshes in the vicinity of the River Avon, small beech-woods, and larger woods of oak and birch at no very great distance. Most of my collecting was done quite near Salisbury, and between Wilton and Wishford, a few miles west of Salisbury. May 22nd was spent at Rhinefield, in the New Forest; July 10th, at Romsey; and July 21st and 24th, at Stonehenge.

Commencing with the butterflies:—*Gonepteryx rhamni*, seen up to the end of May, and from June 23rd the larvæ were found on buckthorn. *P. brassicæ*, *P. rapi*, *P. napi*, all abundant. *Anthocharis cardamines*, common till about the end of June, and a full-grown larva taken in the garden, July 16th. *Argynnis aglaia*, common at Stonehenge; and either this or *A. adippe* also, at Romsey. *Brenthis* (*Argynnis*)

euphrosyne, abundant in June. *Limenitis sibylla* (larvæ), in Rhinefield. *Melanargia galatea*, in fine condition and very locally, near Romsey. *Parage egeria*, common, but worn, Rhinefield. *Satyrus semele* (July), Old Sarum and Stonehenge. *Epinephele ianira* and *E. tithonus*, both abundant. *Cenonympha pamphilus*, abundant. *Vanessa urticae*, common. *V. polychloros*, one full-grown larva found on the Cathedral Green under a wych elm, July 20th. *Thecla rubi*, one, near Wilton, June 5th. *Nemeobius lucina*, taken sparingly, near Wilton, early in June. *Lycana icarus*, abundant. *L. agestis*, fairly common, near Wishford. *L. corydon*, just (August) out on the downs. *Cyaniris argiolus*, near Wilton, June 5th. *Cupido minima*, excessively abundant in sheltered nooks on the downs; I netted four at one stroke. *Hesperia sylvanus*, *H. linea*, *Thanaos tages*, and *Syrichthus malvæ* complete my list of Rhopalocera.

As regards moths, I did scarcely any night-work, and no sugaring at all. A pair of *Sphinx ligustri*, looking very huge, taken at rest on a post on Laverstock Down. *Smerinthus populi*, seen on the street-lamps, and a pupa of *S. tilia* found. *Charocampa elpenor*, taken one evening, flying at phlox in the garden; and a single *C. porcellus* found resting on the ground near a patch of its food-plant, on Laverstock Down. *Macroglossa fuciformis* was out at Rhinefield when I went over, May 22nd. *Anthrocera trifolii*, common near Romsey, July 10th; and *A. filipendulæ* at Stonehenge and on the downs. *Hepialus lupulinus* and *Nola cucullatella* fairly common. *Gnophria rubricollis*, seen near Wilton; and a short series of *Lithosia sororecula (aureola)* obtained from the same locality in May and the beginning of June. A single *Cybosia mesomella*, taken near Romsey. *Euchelia jacobææ*, generally common. A few larvæ of *Arctia caia*, seen early in the year. *Spilosoma menthastri* and *S. lubricipeda* extremely common at light, and *S. mendica* taken at Rhinefield. Males of *Dasychira pudibunda* seen on the lamps. Larvæ and imagos of *Orgyia antiqua* abundant in July. A web of *Eriogaster lanestris* larvæ taken near Salisbury, July 11th, many of the larvæ not half-grown, and most of them stung; I also took two larger ones at Romsey. *Malacosoma (Bombyx) neustria* and *Odonestis potatoria* were both found commonly in the larval state. Two examples of *Gastropacha (Lasiocampa) quercifolia* taken, the first hanging from a very small blackthorn bush, and the other on a street-lamp, July 29th and August 3rd. Larvæ of *Cerura vinula* and *Notodonta dictæa* found on aspen, the latter being full-grown July 5th, and imagos emerged early in August. *Phalera bucephala*, common. *Lophopteryx camelina*, at light. *Drepana falcataria*, near Wilton.

The following Noctuæ were noticed:—*Bryophila perla* (common), *Acronycta psi* (?), *Gonophora derasa*, *Leucania pallens*, *L. impura*, *L. straminea* (one, taken in the Avon marshes among a host of common *Leucanias*), *L. conigera*, *Cymatophora diluta* (a larva, near Wilton), *Xylophasia polyodon*, *X. lithoxylea*, *X. hepatica*, *X. rurea* (a few), *X. sublustris* (one, beaten from beech, Laverstock Down), *Apamea gemina* (on posts), *A. didyma (oculea)* (abundant), *Miana strigilis*, *M. furuncula*, *Mamestra brassica*, *M. anceps*, *M. persicaria*, *Agrotis puta*, *A. exclamationis*, *A. segetum*, *Hadena oleracea*, *H. thalassina* (one), *H. genistæ* (took a dozen in one day from posts near Wilton), *H. dentina* (on posts, very abundant and variable), *Hecatera serena* (fairly common on posts; larvæ swept commonly at Stonehenge), *Dianthæcia nana (conspersa)* (a

nice little series from a fence at Laverstock), *D. capsincola* (one imago; larvæ common in white campion), *D. carpophaga* (larvæ obtained commonly on Laverstock Down in July, by picking handfuls of bladder campion and shaking them into an umbrella), *Plusia gamma*, *P. chrysis* (common in the garden), *P. iota* (larva), *P. moneta* (larvæ in the garden), *Triphæna pronuba*, *T. interjecta* (one, near Wilton), *Grammesia trigrammica*, *Noctua plecta*, *Nania typica*, *Amphipyra tragopogonis* (larva), *Gonoptera libatrix*, *Acontia luctuosa* (Laverstock). *Euclidia mi*, *Cucullia umbratica* (very abundant on posts during May, June, and early part of July; larvæ swept at Stonehenge at end of July). *C. verbascei* (larvæ common on *Verbascum* in June and July; moth taken in the garden in May). *Habrostola urtica* (a few to light); also larvæ of *Orthosia lota*, *Teniocampa cruda* (*pulverulenta*), *T. munda*, *T. stabilis*, *Scopelosoma satellitia*, and *Calymnia trapezina*.

The following Deltoids were noticed:—*Hypæna proboscidalis*, *H. rostralis*, *Pechypogon barbalis* (near Wilton), *Zanclognatha grisealis* (near Wilton), and *Rivula sericealis* (in the marshes).

Geometræ:—*Uropteryx sambucaria*, *Rumia cratægata* (*luteolata*), *Boarmia rhomboidaria*, *B. repandata* (one in the garden), *Tephrosia consonaria* (Rhinefield), *T. crepuscularia* (near Wilton), *T. luridata* and *T. punctulata* (near Wilton), *Metrocampa margaritaria*, *Venilia maculata*, *Amphidasys betularia*, *Phigalia pendaria* (*pilosaria*) larvæ near Wilton. *Odontopera bidentata*, *Eurymene dolabraria* (near Wilton), *Cleora lichénaria* (two localities near Salisbury), *Cabera pusaria*, *Asthena candidata*, *A. luteata* (one, Old Sarum), *Acidalia incanaria*, *Iodis lactearia*, *Hemithea*, *thymiararia*, *Acidalia trigeminata* (abundant), *Ephyra porata*, *E. punctaria*, *E. trilinearia*, *E. omicronaria* (one; all the *Ephyras* near Wilton), *Numeria pulveraria* (a few near Wilton), *Strenia clathrata* (locally abundant), *Halia vanaria*, *Macaria liturata* (Laverstock), *Abraxas grossulariata*, *Ligdia adustata*, *Lomaspilis marginata*, *Minoa euphorbiata* (a few near Wilton), *Larentia pectinitaria* (abundant), *L. didymata*, *Eupithecia pulchellata* (one, Laverstock), *E. subfulvata* (one, to light), *E. venosata* (larvæ from bladder campion, Laverstock), *E. pusillata* (a short series beaten from spruce firs in Rhinefield), *E. subnotata*, *E. centaureata*, *Anticlea rubidata* (one), *Melanthia ocellata*, *Melanippe rivata*, *M. subtristata*, *M. fluctuata*, *M. montanata* (near Wilton), *Fidonia piniaria*, *Panagra petriaria*, *Cidaria corylata* (near Wilton), *C. dotata*, *Coremia* ? *ferrugata*, *Thera variata* (Rhinefield), *Cheimatobia brumata* (larvæ), *C. boreata* (larvæ near Wilton). *Hybernina defoliaria* and other *Hybernina* larvæ very abundant near Wilton. *Hypsipetes elutata* (very abundant), *Eubolia bipunctata*, *E. cervinaria* (larvæ on mallow at Wishford), *Scotosia vetulata* (locally abundant), *S. rhamnata*, *S. dubitata* (larvæ very abundant), *Camptogramma bilineata*, *Anaitis plagiata*, *Mesotype virgata* (locally common at Stonehenge).

Pyalides:—*Botrys ruralis*, *Scopula olivalis*, *S. prunalis*, *Pionea forficilis*, *Hydrocampa stagnata*, *Aglossa pinguinalis*, *Ebulea sambucalis* (one), *E. crocealis* (one, Romsey), *Eurhyphara urticata*, *Orobena extimalis* (*margaritalis*) (a few on Laverstock Down; also a few others undetermined). A few *Aphomia sociella* came indoors to light.

The weather was most unfavourable for dragonflies. *Calopteryx splendens* seemed to be pretty generally distributed, and was taken in Salisbury, by the canal at Romsey, and at Wishford. *C. virgo* was out

in the New Forest when I went over on May 22nd. The only other species I noticed were *Libellula depressa*, in the New Forest and near Wilton; *Pyrrhosoma nymphula*, New Forest, Romsey, and Salisbury; *Ischnura elegans*, Romsey and Salisbury; and *Agrion puella*, Romsey.

Coleoptera:—Numerous, but not yet named.—F. M. B. CARR; 46, Handen Road, Lee, S.E.

NOTES ON A COLLECTION OF BUTTERFLIES FROM BRITTANY.—To record at this distance of time the results of three months' casual collecting in 1899 may seem to savour of official methods. I can only apologise for my want of industry, and trust that the indulgent reader will think this a case in which the proverb "Better late than never" holds good.

Val André, where this collection was formed, is a small *plage* on the Bay of St. Brieuc, in the Department of Côtes-du-Nord. The nearest railway station is Lamballe, about nine miles away. For nine months of the year Val André consists largely of unoccupied furnished houses, but it fills up to an astonishing degree after midsummer. The coast scenery resembles that of South Devon from the Start to Bolt-tail, but is less bold. There are several glens running inland, where tiny streams find their way to the sea, and these are productive of sport to the Nimrod of the net.

I reached Val André at the beginning of May, 1899, but the weather was not at the outset very propitious. It so happened that I had to send to England for some apparatus, and this was mysteriously delayed. At last it was discovered at Lamballe; the authorities had detained it because the contents were not specified outside the parcel, and it was only after some persuasion that they delivered it up to its rightful owner. By May 18th I had seen *Vanessa cardui*, *V. atalanta*, *V. urticae*, *Pieris rapæ*, *Cænonympha pamphilus*, and *Papilio machaon*. *V. cardui* was very common on the coast, and it was there also that we saw an occasional *P. machaon*. It was odd to see this splendid butterfly, which one associates with the peaceful sunshine of the fens, careering about on the steep rock-bound coast. Later in May I saw or took *Lycæna icarus*, *Colias edusa*, *Pararge megæra*, *Melitæa cinxia*, *Euchloë cardamines*, *Gonepteryx rhamni*, *Colias hyale*, *Polyommatus phlæas*, and *Pieris brassicæ*. On May 31st I took two *Nemeobius lucina* in a valley near Nantois. *Melitæa cinxia* was extraordinarily common about this time. There was a hayfield close to the house where I was staying, which simply swarmed with whatever butterflies were in season. After the hay was carried the field produced a plentiful crop of vetch, and *Lycæna batika*, *Aporia crategi*, *Colias hyale*, not to mention less interesting species, could be taken in profusion by stepping outside the door. Two years ago I happened to find myself at Val André for a day, and was sorry to see that this happy hunting-ground had been fenced in.

A ramble with a net in the direction of Nantois on June 7th produced *Syrichthus malvæ*, *Thecla rubi*, *Epinephele ianira*, and another *N. lucina*. By this time *M. cinxia* was beginning to look rather worn. A little later in the month *Melanargia galatea* and *Aporia crategi* put in an appearance. On June 22nd an expedition to a wood a mile or two inland produced two specimens of *Cænonympha iphis*. The colouring

of the under side of this butterfly, simple as it is, seems to me to be one of the beauties of the insect world, Horace's *simplex munditiis*, though the phrase had a very different inspiration, seems to fit this butterfly exactly. I also took a worn specimen of *Melitæa athalia*, and an example of *Pararge egeria*; the latter I had seen one day in May near Tréguier, but had not before this found in the Val André region.

I find a note that *M. cinxia* and *A. cratægi* were still common on July 9th, the former being mostly worn specimens. By this time *Argynnis paphia*, *Satyrus semele*, and *Epinephela hyperanthes* had appeared. The last was particularly common in a glen called Petit Val, where I took it and *S. semele*; also a specimen of *Vanessa polychloros* on July 9th. During this month I also took *Lycæna ægon* and *Pieris napi*, and *Hesperia thaumas* and *H. sylvanus* were common. On July 14th, in one corner of an orchard in the Petit Val, on a bank overgrown with broom and bramble, there were swarms of common things—*galatea*, *tithonus*, *ianira*, *thaumas*, *sylvanus*, *hyperanthes*, &c.; and it was here that I took a very bad specimen of *Lycæna arion*. I secured an even worse specimen on July 31st. My specimens of *Lycæna bætica* were taken on July 19th in the field of vetch already mentioned. On the following day I made an exceptionally good bag in the valley of Flora, between Val André and Dahouet; the captures included a fine *Argynnis adippe* var. *cleodoxa* (I did not take any of the ordinary form), several *A. aglaia* and *A. paphia*, *Vanessa c-album*, *atalanta*, *io*, and *urticæ*, one *Polyommatus dorilis* male, one *Thecla quercus*, one *C. edusa*, and one *P. brassicæ*.

At this point my entomological diary comes for the time being to an abrupt conclusion. However, it is my practice to attach a small label with the date of capture to each specimen, so it is possible to give the record of further captures up to my return to England in the middle of August. The precise localities I cannot at this time recall, but all the insects in the following list were taken in the neighbourhood of Val André:—July 28th. *Pyrgus malvarum* (one), *Lycæna argiolus* (one male), *Polyommatus dorilis* (two males). 30th. *Colias hyale* (one), *Pieris rapæ* (one). 31st. *Lycæna arion* (one), *Thecla ilicis* (two), *Limenitis sibylla* (several). August 2nd. *Thecla betulæ* (one). 8th. *P. dorilis* (one male), *T. betulæ* (one), *Pararge egeria* (one). 11th. *L. argiolus* (one female), *P. dorilis* (one female), *P. phlæas* (one).

I am indebted to Mr. Doncaster, of the well-known firm in the Strand, for identifying several species of which I was not certain.

I paid very little attention to the Heterocera during this visit, but I find a note under the date May 18th that larvæ of *Bombyx trifolii* were common. *Macroglossa stellatarum* was very common at the end of May, and I believe some larvæ of *Deilephila euphorbiæ* were found in the neighbourhood.—DENIS TURNER; 2, Shalston Villas, Surbiton, August 12th, 1903.

THE NEW FOREST IN JULY.—I was met at Brockenhurst Station by a resident friend—a collector—on July 16th, whose first remark to me, after the formal greeting, was "There is nothing to be got here." That was not very cheering to a man who had looked forward to his holidays since the date of those of the previous year, but the remark doubtless was the echo of scores of other collectors in different parts

of the country, probably at the same moment. There is no doubt about it: the New Forest is suffering from the effects of two bad seasons in succession, to say nothing of that "worthy" exterminator, the "dealer," whose ranks there are daily increasing, much to the dismay of the poor collector, who arrives with the idea of having good sport, and gets nothing, except the proverbial "hump"; what little there was had been wiped out. *Leucophasia sinapis* has not been seen for some years, *Apatura iris* is gradually going, so also is *Zygana meliloti*, and *Limenitis sibylla* will be the next to disappear probably; hundreds of the larvæ of this lovely species were grabbed by the "dealer," and thousands of the imago go in like manner, so that it stands to reason, if such unmerciful slaughter goes on, there will soon be nothing left. I know of one instance myself this year where a certain "dealer" was netting all the *L. sibylla* he could possibly lay his hands on, and then retailing them to schoolboys, &c., at one halfpenny each. I should not wonder if he retired this season. We did a little larvæ-beating, but the only species so obtained were three very small *Dasychira pudibunda* and one *Moma orion*. I secured four small larvæ of *Acronycta leporina* a few days before I left, from alder. Sugaring once again was a failure; the only insects that put in an appearance were two *Leucania lithargyra*, four *Thyatira derasa*, one *Nola strigula* (worn), a few *Leucania turca*, *Calligena miniata*, and one *Gnophira quadra*. On the other hand, dusking over heather and in the bogs produced very fair results, and the following were taken, but only in small numbers:—*Acidalia straminata*, *A. aversata*, *Gnophos obscurata* (dark forms), *Pseudoterpna cytisaria*, *Selidosema plumaria* (males only), *Eupithecia nanata*, *Pachycnemia hippocastanaria*, *A. inornata*, *A. scutulata*, *Leucania impudens* (worn), *L. impura*, *L. pallens*, and *Lithosia mesomella*. During the day some very nice *Hyria muricata* (*auroraria*) were seen and captured, but they were more plentiful earlier in the morning, at sunrise; even then we only netted thirty in five journeys, including one specimen quite purple all over. *Lycæna ægon* was in some numbers, and very good in condition; also *Eubolia palumbaria*. Leaving the heather, and entering the "rides" in the enclosures, the following were noticed and captured:—*Aryynnis paphia*, *Limenitis sibylla* (neither of these species was swarming as in previous years), var. *valesina* of *A. paphia* (seven seen, five captured), *Epinephele tithonus*, *E. hyperanthus*, and some larvæ of *Macroglossa fuciformis* from honeysuckle. On the railway-bank, *Satyrus semele* were just coming out, *Hesperia linea* was in plenty, but just getting over, and three *Phytometra anea* (second brood) were taken. On our first evening's sugaring (which produced nothing) one example each of *Thyatira batis* and *Plusia chrysitis* were taken at bramble-blossom, and at about 10 p.m. I netted one *Epione apiciaria*.—A. J. LAWRENCE; Anerley, S.E.

OBITUARY.

We have heard with very great regret that Mr. J. H. Fowler, of Ringwood, died on Aug. 11th last. A further notice will appear in our October issue.

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ABERRATION OF *LYCÆNA ICARUS*.



Upper surface not abnormal in coloration, but the under surface is without ocelli and the discoidal mark on the fore wings is less evident than it appears to be in the figure which is reproduced from an excellent drawing by Mr. Horace Knight. The colour of the under surface of fore wings is pale greyish white; outer marginal band blackish, with a few orange scales on it between veins 2 and 3, and also between 3 and 4. Hind wings white, with some blue scales at the base; outer marginal lunules orange. The specimen, which is a female in beautiful condition, was captured by Mr. George E. Bergman at Lulworth Cove, Dorset, during the summer of the present year.

NOTES ON THE LIFE-HISTORY OF *APORIA CRATÆGI*.

By A. U. BATTLE.

A FEMALE of this species, taken in East Kent on July 19th, 1902, was caged in an inverted glass-shade, the top having been covered with lino and the base filled with damp sand, into which some young whitethorn shoots were stuck. This was placed in a sunny position, and the female fed on sugar every alternate day. The following are extracts from my diary:—

August 1st.—Female dead, having deposited eggs during the last twenty-four hours. These are shining golden yellow, of a small size for the insect, ovoid in shape, and attached by one end in close patches of about one hundred and nineteen and twenty-one respectively on upper sides of two adjoining whitethorn leaves, and forty-seven on under side of another leaf—say about one hundred and eighty-seven in all.

August 26th.—Some of the ova are now turning lead-coloured.

August 29th.—About eight larvæ emerged.

August 31st.—Larvæ have not begun to feed yet, though fresh whitethorn leaves are within one-eighth inch of them, they appear to be spinning a web over the dead leaf close to the eggs and resting thereon. Remainder of eggs developing a dark speck at apex. (*Note*.—These eggs failed to hatch, not more than a dozen emerging in all; possibly this was caused by the juices of the partially dead leaf acting upon the eggs.)

September 1st.—Larvæ have now extended their web to a living leaf, and are feeding on the under surface.

September 7th.—Changed food for first time, leaving larvæ in web on old leaves, and dropping same on new leaves.

September 9th.—Larvæ have not moved for two days, and appear to be hibernating.

September 13th.—Larvæ are feeding again.

September 16th.—Put some plum into cage.

September 18th.—Larvæ are eating plum freely, feeding only on the under side of the leaf where a hawthorn leaf overlaps. They remain in their nest during the day, and feed at night.

September 28th.—Put in more plum, larvæ having eaten the under surface of about a square inch. There are now six larvæ alive, one in second (?) skin, just ready to change, the others in third skin, the longest being about a quarter of an inch. They are very hairy, reminding one of young *Malacosoma* (*Bombyx*) *neustria*. They have formed a tight nest of a curled dead leaf attached to a living one, but chiefly rest on the denuded surface of the living leaf.

October 5th.—Larvæ still feeding slowly. They have now attached their nest very firmly to adjacent twigs by bands of silk threads.

October 19th.—Larvæ have not left their nest for a week or ten days, so removed the cage into a cool place in the garden for hibernation.

March 21st, 1903.—Three larvæ out of hibernaculum. Removed them from old web, and placed them on budding shoot of whitethorn.

March 26th.—Larvæ have spun up in terminal shoot of whitethorn, and are feeding on the entire leaves.

April 1st.—Larvæ now nearly three-eighths of an inch long. They feed in the sunshine, retreating into their nest at night.

April 4th.—They now roam more from their nest by day.

April 9th.—One larva shed its winter coat, and is now much more hairy and brightly coloured, much like *Malacosoma (Bombyx) castrensis*.

April 16th.—All three larvæ have now shed their winter coat, the largest being five-eighths of an inch long.

April 17th.—Gave fresh food, whitethorn and plum, larvæ at once attacking the latter.

April 21st.—Largest larva laid up for final moult. Only slight traces of a web have been made since changing food.

May 1st.—Description of largest larva: About one inch long, rather flabby; curls in a loose ring when touched, but immediately relaxes and crawls away; rests on a few silken threads stretched over a plum-leaf; feeding rapidly in the sunlight. Head and second segment black, dorsal line black, then a red brown band interrupted by black at the divisions of the segments, then another black band ending just above the spiracles; ventral area grey; spiracles nearly black. The whole body is clothed in dense silky hairs, the longest nearly one-eighth inch long, all grey on the ventral area, the longer ones on the other parts of the body being also grey, while the short hairs on the red-brown parts are red-brown. Legs black, claspers grey.

May 13th.—Largest larva forming silk pads for pupation, being now one and a quarter inches long.

May 19th, 21st and 24th.—Dates of pupation. Pupa nearly one inch long, pale greenish yellow, with dorsal line on thorax, outlines of head and collar and entire ventral surface black; a chain of black spots along the hind margin of wing-cases, and a row of four or five large black spots across disc; abdomen also spotted with black. Point of head, spots on collar, and spiracular line bright yellow, towards which colour the ground colour inclines in some places, notably thorax and dorsal line on abdomen.

June 12th.—Second pupa developing for emergence. The wing-case appears to have extended by the unfolding of a crease on its hind margin, thus leaving a pale border beyond the chain of black spots, both these and the discal spots being now seen to be between the wing rays.

June 11th, 17th and 21st.—Imagines emerged (one male, two females), being about a fortnight earlier than the normal time of emergences in the wild state for this season.

“Kingsfield,” Hunters Forstal, Herne Bay:
Sept. 22nd, 1903.

ASPHONDYLIA ULICIS, TRAILL.

By T. A. CHAPMAN, M.D., F.E.S.

I HAVE not been able to find any original notes on this species beyond those of Mr. Verrall. I found the species very abundant here this August. It probably is, in many places, very often, if looked for, as Mr. Verrall suggests. What led me to take an interest in it was the dimorphism, if that word is correctly applicable, of the galls. Mr. Verrall notes that they resemble the flower-buds, but are larger. As a matter of fact, one form of them *are* the flower-buds, and the gall is often easily separated into the two divisions of the calyx; at its base are the two floral bracts. The larva, in fact, occupies the cavity of the calyx, and the inner parts of the flower are wanting, how disappearing I do not know. But, as well as this, the gall has another form, which is the seed-vessel, not very much altered in appearance. They remain rather soft, are rather swollen basally (the gall) and dwindled a little at the apex. The two valves of which they consist are nearly as distinct as in a normal seed-vessel; they equally terminate in the remains of the style, and are surrounded in the same way by the dead and dry calyx and corolla. There seems no very definite reason why the apical portion of the seed-vessel should not contain some traces of a seed, but, as a matter of fact, I cannot find such an example.

Those in the seed-vessels are about a week later in emerging than those in the buds. In mid August, when I found them, the enlarged buds were very conspicuous, there being no normal buds on the plant, indeed, all the normal inflorescence was in the form of seed-pods already black or blackening, but not ripe. The galls, formed of seed-pods, were less conspicuous, because hidden to some extent by the dried floral envelopes, but when seen were really conspicuous, from being quite green, and so differing from the ordinary pods.

I know too little of gall-midges to know whether this variation in the situation of the galls is common; it was new to me. Is there some other name for these than galls? If galls be typically those of the Cynipidæ, the residence of the larva in a "gall" is actually in the plant tissues. In most gall-midges I know, the larva is *outside* the plant, *i.e.* the inside of the gall is naturally an external surface of the plant, and not a morbid cavity in the tissues. This is true morphologically of the cavity of a seed-vessel, as in *Asphondylia ulicis*.

Betula, Reigate: September, 1903.

EMERGENCE OF *ÆSCHNA GRANDIS*.

By H. T. DOBSON, F.E.S.

My friend, Mr. W. J. Lucas, the author of 'British Dragonflies,' having asked me to take charge of two nymphs of *Æschna grandis* during his absence from home, I gladly accepted his offer, thinking that I might learn something of the habits of this species; a desire which, I am pleased to say, has been fully realized.

One nymph died in a few days, but the other I fed daily with a worm for several weeks, till at last it refused food, and then rested for several days just under the surface of the water on a lily leaf. After this period of rest, it crawled up a thin green stick till it had reached several inches above the water; this was done on the morning of August 26th. The insect having surveyed this new aspect of life seemed somewhat alarmed, and descended into the water again, resting on the under surface of the lily-leaf. In this position I observed it several times during the following day; however, at 8 p.m., the nymph left the water and ascended a green twig until it had risen about six inches above the water.

From that moment it seemed to commence the real work for its future life. However, before I begin a description of the emergence, it would be as well to observe that there was no daylight at 8 p.m. on August 27th, and that the only artificial light I had in the room at the time was one candle, a light which was not increased until the nymph-case was broken.

At five minutes past eight the upper part of the insect was dry, and it was quite obvious that great internal exertions were being made. Two minutes later I observed that the head of the embryo dragonfly had been drawn through the neck and below the head of the nymph. In another one and a half minutes, or, to be exact, at eight and a half minutes past eight, the skin of the nymph below its head had so swollen that it split, when instantly emerged the head of the fly. In twenty seconds the legs were partly visible, and the work of drawing them out of their old case continued till all were free by ten past eight. The next moment the released portion of the insect fell down, the head facing the water. A rest of twenty-five seconds followed, after which the struggle for freedom continued, so much so that by fourteen minutes past eight, seven segments were outside the case. During the efforts that were made while the insect was head downwards, I observed that the wing-cases of the nymph had been placed across the twig that it hung upon, so as to form a lever for the new-born fly to pull against. By fifteen minutes past eight the only movements observable were in the legs, which were quivering; then the first pair were placed round its head.

For the next seven minutes it remained motionless, and thus gave me time to take a sketch of its position. At thirty-two

minutes past eight it suddenly darted up, as if a spring had been released, and clutched with its legs at the head of the nymph-case. Five seconds later and the remaining portion of the body was out of the case and hanging below it, the whole length being two and one-eighth inches. By thirty-five minutes past eight the tiny wings looked like pieces of snow, and began to expand; the growth was so rapid that in two minutes they had extended from about half an inch to one and one-eighth inches long, their colour being cream with a tinge of green in it. At forty minutes past eight the body and head were trembling with emotion, the wings had extended to one and a half inches long, and the two lateral stripes on the thorax were appearing. Measuring the wings at 8.42 p.m., they were one and three-quarter inches long and opaque. During the next two minutes my notes and sketches show the body to be very much curved, so that the wings drop much below it. The dragonfly appeared to be exerting every muscle in order to fully develop its wings. At forty-eight minutes past eight the pterostigma became visible; they were a light green colour. Two minutes later, and the hitherto opaque wings became transparent. At 8.55 p.m. it was perfectly still, and (with the exception of moving its legs at 8.57) it remained absolutely quiet for twenty-five minutes, the body hanging in a straight line below the head. The wings were then hyaline, and the nervures were showing plainly. It continued to rest till 10.28 p.m., when it moved its head, and in one more minute the wings quivered and spread wide open, the costal margins of the fore wings being at right angles with the body. In that graceful position it remained till 11.39, when suddenly it flew round the room. At this point the lights were extinguished, and on the following morning *Æ. grandis* was found clinging to the wall with wings so well coloured that I deemed it wise to prepare it for the cabinet.

Ivy House, New Malden.

A LIST OF THE LEPIDOPTERA OF THE ISLAND OF CAPRI; WITH A FEW NOTES.

By C. SEYMOUR BROWNE.

For such a small island the number of species of Lepidoptera will be found of great interest to the entomologist. Considering that the greatest length does not exceed $6\frac{1}{2}$ kilometres, the breadth $2\frac{1}{2}$ kilometres, and that the total area does not amount to more than about 15 square kilometres, and that this space contains a population of 6000, it is remarkable that such a quantity of lepidopterous insects are to be found in such a limited area. This, however, is due in a great part to the mountainous

character of the land, which attains at Monte Solaro—the highest point—an altitude of 608 metres above the level of the sea, and also to the fact that, while many parts of the island are under close cultivation, other portions are wilderness and rugged rock, with precipitous cliffs sheer down to the sea, where the larvæ remain undisturbed, so many conditions favourable to the development of Lepidoptera are met with. The food-plant is extremely varied, and anything approaching a severe frost is a thing unknown.

A list must necessarily be imperfect, especially when there are no previous data to go upon; I can find no trace of any systematic study of the Lepidoptera of the island.

The Costas, father and son, have left an enormous amount of information regarding the Neapolitan district, of which Capri forms a part; but their works, being mostly contributions to journals, are difficult to find, and the result of their researches laborious to classify.

Many Lepidoptera are rarely found, some owing to scarcity, others to reclusive habits, and many only appear in certain years; and it is not uncommon to come across a specimen which can only be treated as a kind of pilgrim, such as are usually classed amongst the doubtful species of a locality. I have only observed one or two fully developed specimens of such common insects as *Brotolomia meticulosa*, Linn., and *Phalera bucephala*, Linn., though plenty of pupæ have been brought to me. So there must be many gaps in my list, and plenty of opportunity for further research. I have used the names and numbers as given in Staudinger and Rebel's Catalogue, 1901 edition:—

PAPILIONIDÆ.

4. *Papilio machaon*, L. Common on the edge of the cliffs by the sea.

PIERIDÆ.

45. *Pieris brassicæ*, L. Very common.

48. *P. rapæ*, L. This year (1903) has been a small plague, appearing in numbers, end of July, though previous year only ordinarily common.

57. *P. daphidice*, L. Fairly common on the mountains, appearing end of summer.

62a. *Euchloë belia*, Cram. var. *romana*. Calberia, common.

113. *Colias edusa*, Fab. Very common all through the year, except winter.

113b. *C. edusa*, Fab., female ab. *helice*, Hüb. Two specimens in July, 1903; none noticed last year.

125. *Gonepteryx cleopatra*. L. A few specimens, females scarce.

NYMPHALIDÆ.

152. *Pyrameis atalanta*, L. Fairly common; observed a specimen in March.

154. *P. cardui*, L. Very common, was one of the first butterflies, appearing in thousands in May, but all worn specimens; had they hibernated?

167. *Polygonia egea*, Cram. Common.
 185. *Melitæa didyma*, Ochs. Common.
 225. *Argynnis lathonia*, L. One specimen, 1903, in July.
 341. *Satyrus hermione*, L. Very common in summer and autumn.
 352. *S. semele*, L. Very common.
 370a. *S. statilius*, Hufn., var. *allionia*, Fab. Common on the mountains in autumn.
 385. *Pararge ægeria*, L. Fairly common.
 390. *P. megæra*, L. Common.
 392. *P. mæra*, L. Scarce.
 402a. *Epinephele jurtina*, L., var. *hispulla*, Hüb. Common.
 423. *E. ida*, Esper. Male appears first, and when female appears very few males to be found unworn.

LYCÆNIDÆ.

- *464. *Thecla ilicis*, Esp.
 482. *Zephyrus quercus*, L. One specimen (female), 1902, and one undeveloped specimen, 1903, both in late summer.
 512. *Chrysophanus phlæas*, L. Fairly scarce.
 529. *Lampides bæticus*, L. Common in late summer.
 604. *Lycæna icarus*, Roth. Fairly common, early summer.
 638. *L. sebrus*, Boisduval. Fairly common amongst the broom in early summer.
 635. *L. minimus*, Fues. Same as *L. sebrus*, but not quite so common.
 638. *L. cyllarus*, Rott. Fairly common, early summer.
 650. *Cyaniris argiolus*, L. Very common.

(To be continued.)

NEW CULICIDÆ FROM THE FEDERATED MALAY STATES.

BY FRED. V. THEOBALD, M.A.

AMONGST a large collection of beautifully mounted mosquitoes sent to me for identification, and collected and bred by Dr. Durham, I at once detected several new species, including a *Stethomyia*. This genus, which I founded on a species taken by Dr. Durham and others in South America (*S. nimba*), was represented by that species only until the one here described came to hand,—strange to say, by the discoverer of the first species in another continent.

The characters upon which the genus was founded are more pronounced in the males of the Malayan species than in the type of the genus.

The collection also contained a new *Nyssorhynchus* and a new *Skusea*, also described here.

Amongst others in this collection are the following:—*Nyssorhynchus albirostris*, Theob.; *N. maculatus*, Theob.; *Myzorhynchus sinensis*, Wied; *M. vanus*, Wlk.; *M. barbirostris*, Van der Wulp;

Myzomyia rossii, Giles; *Desvoidea ventralis*, Walker; *Culex mimeticus*, Noe.; *Stegomyia scutellaris*, Wlk.; *Teniorhynchus conopas*, Frau.; *T. brevicellulus*, Theob.; *Mansonia annulipes*, Wlk.; *M. annulifera*, Theob.; *Finlaya poicilia*, Theob.

Genus *STETHOMYIA*, Theob. (Mono. Culicid. iii. p. 62, 1903).

Stethomyia fragilis, n. sp.

Thorax ochraceous brown; abdomen, legs, palpi, and proboscis deep brown; antennæ white with brown plume-hairs. Legs long, delicate.

♂. Head deep brown with small flat creamy scales between the eyes and partly above; narrow brown upright forked scales behind; eyes deep purple; proboscis long and thin, deep brown, paler at the base; antennæ with testaceous basal joint, apex brown, remainder white with narrow brown rings and brown plume-hairs; palpi pale brown with deep brown scales, last two joints swollen with a few black bristles; head united to thorax by rather a long neck. Thorax bright ochraceous brown, almost nude, a few scattered long irregular deep brown hairs; scutellum pale greyish brown, nude; the pale brown border-bristles alternately long and short; pleuræ ochraceous brown with a greyish sheen; metanotum chestnut-brown; prothoracic lobes ochraceous brown with a few black bristles, very distinctly mammillated. Abdomen very narrow, expanding apically, deep brown to almost black, with longish curved black hairs; genitalia pale testaceous; claspers long and thin. Legs long and thin, deep brown; coxæ very pale; fore legs with apparently only one claw, which is large and biserrated, one tooth being basal; mid ungues equal, simple, moderately large, curved; hind small, equal and simple, nearly straight. Wings with the veins with pale brown lanceolate scales; those on the subcostal, first long vein and basal part of costa short and rather broad; first submarginal cell very long and narrow, nearly twice the length of the second posterior cell, both cells about the same width; base of the first submarginal a long way nearer the base of the wing than the base of the second posterior; stem of the first submarginal nearly half the length of the cell; stem of the second posterior nearly twice as long as the cell; mid cross-vein a little nearer the apex of the wing than the supernumerary; the posterior cross-vein about half its length nearer the base of the wing than the mid. Halteres with pale stem and slightly fuscous knob, which is curved in the middle. Length 4 mm.

Time of capture. January and December.

Hab. Kuala Lumpur, Federated Malay States.

Observations.—Described from two males bred by Dr. Durham. Types in the British Museum (Nat. Hist.). This is the second species of *Stethomyia* so far known, the other species occurring in S. America. The characters of the genus—namely, the mammillated prothoracic lobes and the flat scales between the eyes, &c.—are very marked. It is a very delicate-looking mosquito, and differs completely from the dark *S. nimba*, Theob. (Mono. Culicid. iii. p. 62).

Dr. Durham sends me the following note concerning this species:—"Sunday, Jan. 18th, 1903. Larvæ and pupæ collected about two miles away (from Kuala Lumpur) in pool in jungle. Clear water pool, surrounded, and more or less hidden, by shrubs and ferns; looks as if it might have been a drinking-water dipping well since abandoned, about four feet in diameter, and two to three feet deep, near a stream and some dried-up swamp where *Culex mimeticus* larvæ had been caught. Numerous small dark *Anopheles*-like larvæ, which all died before transforming; there were also some quite minute pupæ. Only two hatched out. The long-palped species sat *à la* Anopheline at an angle."

Genus NYSSORHYNCHUS, Blanchard (Mono. Culicid. iii. p. 92, 1903).

Nyssorhynchus nivipes, n. sp.

Thorax black, with snowy white spindle-shaped scales; pleuræ mottled with dark and light brown; abdomen black, hairy, with pale scales on the last two segments and genitalia. Wings with three large and three small basal costal spots; the third black spot the largest, with three small spots beneath; most of the veins pale scaled, the fourth dark up to the fork. Legs deep brown; the fore and the mid with apical pale bands, the hind with the last three tarsi white, and also the apex of the preceding one.

♂. Head deep brown, with a tuft of snowy white upright forked scales and a slight pale border around the eyes, two snowy white bristles projecting forwards and some brown ones laterally; antennæ brown with flaxen and white plume-hairs; basal segments with brown and white scales; palpi brown, clavate, two white ventral patches on the apical swollen part, and some white scales ventrally on the remainder, a few brown lateral hairs on the last two joints; proboscis thin, black. Thorax black to blackish-brown, with scattered snowy-white spindle-shaped scales and some brown ones projecting forwards between the thorax and nape; prothoracic lobes brown with white scales; scutellum with spindle-shaped white scales; pleuræ dark and paler brown, slightly mottled, and with scattered white scales. Abdomen black, with brown hairs, the last three segments with narrow white scales, especially on the apical borders; genitalia densely scaled with small flat and narrow-curved white scales. Wings ornamented much as in *N. stephensi*, but the fourth black spot on the first long vein extends backwards past the small white costal spot; there are also more dark scales on the branches of the first submarginal cell, and three (not two) spots on the upper branch of the fifth vein. Legs brown; the fore pair with apical pale bands to the metatarsi and first two tarsi, and a white apical spot to the tibiæ; ungues unequal, the larger biserrated; mid legs with a pale apical band to the metatarsi only, and a trace of a pale tibial spot; ungues equal (apparently), both uniserrated; hind legs with the last three joints white; also the apical half of the first tarsal, apex of metatarsus and tibiæ also white; claws small, equal, and simple. Length 3.5 mm.

Hab. Kuala Lumpur (Fed. Malay States).

Time of capture. January.

Observations.—Described from three males taken by Dr. Durham. They come very near *N. stephensi*, the wing ornamentation being almost the same; the thoracic scales are spindle-shaped, not narrow-curved, and the legs are not speckled. In *stephensi* the hind legs are not white at their apex as in this species. It also comes very near *N. maculatus*, but differs in (1) the mid unguis of the male not being simple, and in (2) the greater number of white hind tarsal segments.

Genus SKUSEA, Theob. (Mono. Culicid. iii. p. 291, 1903).

Skusea diurna, n. sp.

Head black, with a narrow pale median line, and paler at the sides; proboscis brown; thorax richly brown scaled; pleuræ black, with silvery spots; abdomen black, unbanded, with basal lateral silvery spots. Legs dark brown, unbanded, paler at the base and beneath the femora; femora rather swollen.

♀. Head covered with flat black scales, a narrow indistinct line of dull creamy ones and a few pale dull blue ones at the sides; a few thick black bristles projecting over the golden eyes; clypeus black, truncated with a slight median depression, in certain lights with grey sheen; palpi and proboscis brown, the former very short; antennæ brown, base of second joint bright testaceous. Thorax black, covered with rather long rich-brown narrow-curved scales, a few paler scales in front, over the head; scutellum deep brown with narrow-curved brown scales, and five median border-bristles; pleuræ brown, with silvery white spots. Abdomen black, with small, nearly basal, lateral white spots; border-bristles dull brown; venter brown. Wings with brown scales; the first submarginal cell a little longer but no narrower than the second posterior cell, its stem about two-thirds the length of the cell, its base nearly level with that of the second posterior cell; stem of the latter as long as the cell; posterior cross-vein about one and a half times its own length distant from the mid cross-vein. Halteres with ochraceous stem and fuscous knob. Legs deep brown, unbanded; femora pale ventrally; bases of the legs slightly pallid; femora rather thickened, slightly hairy; tibiæ with long bristles and a row of short ones, also a few apical bristles; unguis equal and simple. Length 4 mm.

Hab. Jugra, Kuala Lumpur.

Time of appearance. September.

Observations.—Described from a female in perfect condition bred by Dr. Durham from a larva collected in the hospital reservoir at Jugra. It certainly comes well in the genus *Skusea*, but there are only five mid scutellar bristles. It is a day flyer. It bears a strong resemblance to *S. multiplex*, but differs in having simple unguis and unadorned thorax.

DESCRIPTIONS OF TEN NEW SPECIES AND NINE NEW GENERA OF ICHNEUMONIDÆ FROM INDIA, CEYLON, AND JAPAN.

By P. CAMERON.

(Concluded from p. 241.)

LEPTOTHECUS RUFOMACULATUS, sp. nov.

Black; the middle of the propleuræ broadly, the base narrowly, the upper half of the mesopleuræ, the centre of the mesosternum, the mesonotum, and the basal half of the scutellum broadly in the middle, rufous; the two outer areas of the median segment, the apex of the spiracular area, with the spines and the apex of the pleuræ above, yellow, the posterior median area and the part on either side above it rufous. Legs pallid yellow, the fore femora below, the middle above and at the base below, the hinder coxæ, except at the apex, the femora entirely, and the apex of the hinder tibiæ, black. Wings clear hyaline, the stigma testaceous, the costa and nervures black. The second to fourth ventral segments yellowish, the dorsal narrowly at the apices, the last yellowish in the middle above, broadly at the apex, narrowly at the base. The twelfth to twenty-second joints of the antennæ clear white, the scape thickly covered with white pubescence, its basal half rufous beneath. Face, clypeus, inner orbits narrowly at the front, more broadly above the frontal depression, narrowly on the outer orbits above, broadly below, and the malar space, yellow. ♀. Length, 17 mm.

Hab. Darjeeling.

Face sparsely punctured, the sides with a few striæ, the clypeus smooth; both are sparsely covered with glistening white hair; the front, vertex, and occiput shagreened, and thickly covered with white pubescence. Base of mandibles broadly yellow. Scutellum coarsely granular, thickly covered with short white pubescence. Areola coarsely closely transversely striated, as are also the lateral areas. Pleuræ closely punctured, the apex of the pro- and the base of the meso-striated; the meta- on the basal two-thirds closely longitudinally striated.

PHÆOGENINI.

BENECLES, gen. nov.

Metathoracic spiracles small, almost circular. Median segment completely areolated, obliquely depressed at the base, the sides not toothed, but with the keel at the apex in the middle prominent; the areola wider than long, slightly narrowed towards the apex. Scutellum roundly convex, not much raised above the level of the mesonotum, its sides keeled at the base. Apex of clypeus broadly transverse, its sides above with an oblique furrow. Mandibles unequally toothed, the apical long, sharply pointed, the subapical short, indistinct. Temples small, obliquely narrowed. Post-scutellum stout; the gastrocœli shallow, distinct; the lunulæ large. Areolet 5-angled, narrowed above; the disco-cubital nervure without the stump of a nervure. Antennæ longer than the body, the scape distinctly shorter than the

first joint of the flagellum, which is much longer than the following joint. Hinder legs much longer than the anterior. The ovipositor largely projects. The transverse basal nervure is interstitial. In the hind wings the transverse median nervure is broken far below the middle. The apex of the metathorax is not produced beyond the insertion of the hind coxæ. Apex of abdomen marked with white.

The small round metathoracic spiracles refer this genus to the Phæogenini. In Ashmead's 'Classification of the Ichneumon Flies' it would come in near *Herpestomus*. Characteristic is the long sharp pointed apical and the indistinct subapical tooth of the mandibles.

BENECLES RUFOMACULATUS, sp. nov.

Black; the mesopleura, the mesosternum, the median segment, the petiole, the four anterior legs, the posterior coxæ, trochanters, and femora, except at the apex, red; the flagellum broadly in the middle and the apex of the abdomen white; the wings hyaline, the nervures and stigma black. ♀. Length, 9 mm.

Hab. Ceylon, Trincomali (Col. Yerbury).

Front, vertex, face, and clypeus closely, regularly, and distinctly punctured; the apex of the clypeus smooth and shining. Mandibles and palpi black; the apex of the former smooth and shining. The metanotum is less closely and more strongly punctured than the mesonotum; its basal depression is smooth; the areola is obscurely shagreened, and has a longitudinal keel in the centre on the apical half. The apex of the pronotum has a striated margin; the base of the mesopleuræ closely longitudinally striated. The centre of the post-petiole is smooth; the sides are depressed and obscurely punctured; the base of the second segment is irregularly striated; the shallow gastrocoeli are rufous. The antennæ are as long as the body; the hinder tibiæ have a broad dull reddish band near the base; the hinder tarsi are black, the base and the calcaria testaceous.

A NEW COCCID FROM MADEIRA, ALLIED TO
COCCUS TUBERCULATUS, BOUCHÉ.

By T. D. A. COCKERELL.

IN the 'Entomologist,' March, 1901, p. 93, I called attention to the peculiar characters assigned to *Coccus tuberculatus*, Bouché, remarking that I had seen nothing like it. The insect now described is of peculiar interest, because it has the dorsal projections of *C. tuberculatus*, and is evidently closely allied. It settles beyond doubt the position of Bouché's species in *Pulvinaria*.

PULVINARIA GRABHAMI, n. sp.

♀. Oval, flattened, reddish-brown, often blackened dorsally; 1½ mm. long, 1¼ broad; ovisac white, convex, broad, loose, not

adhering to objects touching it, not parallel-sided nor ridged. Margin with long simple bristles; stigmatal spines ordinary, short; antennæ 7-jointed; legs ordinary, claw digitules $30\ \mu$ or more long, with large knobs; tarsal digitules rather stout, fully $54\ \mu$ long. Measurements of legs and antennæ in μ :—Anterior leg; femur + trochanter 156, tibia 108, tarsus 70. Antennal segments: (1) 30, (2) 33, (3) 48, (4) 30, (5) 30, (6) 24, (7) 48. Immature specimens, up to maturity, have a dorsal row of five to nine erect white waxy keel-like projections; in some immature examples these projections seem to have a circular base.

Hab. Public garden at Funchal, Madeira, on the under side of leaves of *Jossinia tinifolia*, together with *Aspidiotus rapax*. Dr. M. Grabham, who collected the specimens, informs me that they are attended by the ant *Iridomyrmex humilis*.

P. grabhami differs from *Pulvinaria tuberculata* (Bouché) by its smaller size, and the fewer dorsal processes; the antennæ also differ from Bouché's account, which, however, is almost certainly incorrect as to the number of joints. The antennæ of *P. grabhami* resemble those of *P. populi* (which is a much larger insect) except in the last joint.

Dr. Grabham also brought me some leaves of *Apollonias canariense* from the Funchal public garden. These show many large blister-like protuberances on the upper surface, corresponding to deep cavities beneath. These galls, which are evidently the product of a mite (*Eriophyes*), contain two species of Coccids, *Aspidiotus rapax* and *Fiorinia fioriniæ*.

Pecos, New Mexico, U.S.A.: June 5th, 1903.

CURRENT NOTES.—No. 2.

By G. W. KIRKALDY.

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2. W. L. FISKE: "A Study of the Parasites of the American Tent-Caterpillar," New Hampshire Coll. Agric. Exper. Sta. Techn., Bull. no. 6, pp. 180–230, 6 text figs. 1903 [Lep. and Hymen.].
3. O. W. BARRETT: "The Changa, or Mole Cricket (*Scaptariscus didactylus*, Latr.) in Porto Rico," Bull. 2, Porto Rico Agric. Exper. Sta. pp. 1–19, text figs. 1902 (also in Spanish) [Orthopt.].
4. H. SCHOUTEDEN: "Les Aphidocécidies paléarctiques. Descriptions d'Aphides Cécidogènes nouveaux," Ann. Soc. Entom. Belg. xlvii. pp. 167–95, 1903 [Rhynchota].
5. A. L. MONTANDON: "Hémiptères aquatiques. Notes synonymiques et géographiques. Descriptions d'espèces nouvelles," Bull. Soc. Sci. Bucarest. xii. pp. 97–121, 1903.

6. H. J. HANSEN: "The Genera and Species of the Order Symphyla," Quart. Journ. Micr. Sci. (n. s.), xlvii. pp. 1-99, pls. 1-7 (1903?).
7. E. P. FELT: "The Literature of Economic Entomology," Bull. U.S. Dep. Agric., Entom. (n. s.), 40 [Proc. 15th Ann. Meet. Assoc. Economic Ent.], pp. 7-22, 1903.
8. E. P. FELT: "Importance of Injurious Insects introduced from Abroad," Proc. 24th Ann. Meet. Soc. Promotion Agric. Sci. pp. 1-10, 1903.
9. E. P. FELT: "18th Rep. State Entom." (for 1902), pp. 89-179, 2 text figs., 6 plates (1 col.), May, 1903 [University Bull. 283; State Mus. Bull. 64; Entom. Bull. 17].
10. W. L. DISTANT: "Rhynchotal Notes," Ann. Mag. Nat. Hist. ser. 7; iv. pp. 29-52; 213-27; 421-45; v. pp. 386-97; 420-35; vi. pp. 55-64; 220-34; 365-80; vii. pp. 6-22; 416-32; 531-41; viii. pp. 461-86; 497-510; ix. pp. 34-45; 353-62; x. pp. 173-94; 245-58; 282-95; 352-67 (1899-903).
- 10a. J. J. KIEFFER: "Monographie des Cynipides d'Europe et d'Algérie, vol. ii. fasc. 1" [being the first fasc. of the 2nd part of the 7th vol. of André's "Species des Hymenoptères d'Europe et d'Algérie"], pp. 1-288, pls. i.-ix. (1903).

The most important of recent entomological productions is undoubtedly Dr. Sharp's Monograph of the Hawaiian Caraboidea (1), a work which is the result of an unrivalled knowledge both of Coleoptera in general and of the Hawaiian forms, some 6500 specimens of the latter having been examined. It is no bald systematic monograph, but a practical application of philosophic principles to the elucidation of the phylogeny of the remarkable Hawaiian Caraboidea. Under the latter term, Sharp comprises what are perhaps better known as Adephaga. Of the 212 (or so) Hawaiian species, two are Dytiscidæ,* 210 Carabidæ, of the subfam. Harpalinæ. Of these 212 (of which 149 are described for the first time) 211 are precinctive, the single exception (*Plochionus pallens*) being so widely distributed, according to Bates, that its original home cannot be determined. It frequents the baggage of passengers, and is thus easily disseminated. It is still, however, very rare in the Hawaiian fauna. The four species of *Tachys*, although unknown elsewhere, are possibly not precinctive.

Dr. Sharp finds that the Hawaiian Carabidæ are in their main divisions "concordant with those of other parts of the world, but that they exhibit in an exaggerated form certain features that elsewhere are comparatively rare. The chief of these are (1) flightlessness, (2) a diminished chætotaxy." Upon these generic characters are relied almost exclusively, and under

* It is probable that these will be increased on later researches, as little appears to have been done in capturing aquatic forms in Hawaii-nei.

this system "an individual, by a simple process of discontinuous variation—such as there is reason for believing actually occurs—may *ipso facto* pass from the genus of its parents to another. It follows that the contemporary members of one generation may possibly belong to two different genera, though having the same specific parentage. . . . These dislocations of taxonomy—if they occur at all—occur but rarely."

"The precinctive Hawaiian Carabidous fauna may . . . be considered to consist of 209 species, belonging entirely to three groups" (Anchomenides, Pterostichides, and Bembidiides). "The Carabidous fauna of the United Kingdom of Great Britain and Ireland consists of about 315 species, belonging to 25 groups. The remarkable taxonomic concentration of the Hawaiian fauna is not, however, adequately expressed by this brief statement, because the Pterostichides form generally one of the largest and most varied of all the groups of Carabidæ in all parts of the world; but in the Hawaiian fauna it includes 78 species, all of which would be placed in a single genus, *Cyclothorax*, were it not that I have separated them therefrom, and divided them into four genera on certain of the degradational characters that form so marked a feature of the Hawaiian Carabidæ."

The flightlessness of these forms is discussed at length, and the author notes the common mistake that flightless or wingless beetles are apterous, nearly the whole of the so-called apterous species really possessing four wings. Dr. Sharp, moreover, holds that organs which are functionally useful "may become again increased after having undergone reduction."

With regard to the prothoracic setæ, although irregularities occur, Dr. Sharp considers that it is "safe to rely on the seta for discriminative purposes."

Of the precinctive species, nearly the whole of the species are confined to a single island; when this is not the case, the localities are nearly always on adjacent islands.

The paper, of which it has been possible to give only a most inadequate sketch, is concluded by a series of bionomic notes, gathered from correspondence between Dr. Sharp and Mr. Perkins. There are also two elucidatory plates.

(To be continued.)

NOTES AND OBSERVATIONS.

THE NATIONAL COLLECTION OF BRITISH LEPIDOPTERA.—Recent additions to this Collection are—ten male specimens of *Miana arcuosa* from the Rev. H. H. Slater, Thornhaugh Rectory, Wansford; and an example of *Plusia bractea* from W. McIntosh, Esq., Nevay Park, Meigle, N.B.

INSECTS OF NORTHAMPTON.—In the Northamptonshire volume of the 'Victoria History of the Counties of England' the lists of insects are hardly so full or complete as those that have appeared in some other volumes of the series. It would seem that little, if anything, is known of the Orthoptera, Neuroptera, Diptera, and Hemiptera; at all events these orders are not included, and the editor states that he has been quite unable to obtain lists of such insects. Very few species of Hymenoptera are recorded, and the list of Coleoptera would seem to be most incomplete. The Lepidoptera come out more satisfactorily, but the groups usually referred to as "Micros" appear to have been sadly neglected. It is certainly surprising that such interesting families as the Pyralides and the Tortrices, for instance, should be so little in favour with collectors.

BUTTERFLIES OF DERBYSHIRE.—The Rev. Francis C. R. Jourdain has published (Derbyshire Archæological and Natural History Society's Journal, 1903) an annotated list of the butterflies that have been observed in Derbyshire. Forty species are admitted, but the author states that most of these "can only be regarded as rare or accidental visitors, and only about fifteen species can be considered really common anywhere." *Papilio machaon*, *Ceanonympha typhon*, and *Thecla pruni*, are also referred to, in brackets, as the evidence of their occurrence in the county is not satisfactory, while *Syrichthus malvæ* is mentioned as having been erroneously recorded in a previous list (Entom. xxviii. 51). The English as well as the Latin names of the species are given.

'PRACTICAL HINTS FOR THE FIELD LEPIDOPTERIST.'—Of this exceedingly useful work, which has been produced by Mr. J. W. Tutt, we have received Parts 1 and 2. The contents provide a considerable amount of information concerning the possible lepidopterous work to be done during each month of the year. The collector of experience as well as the beginner will find the books packed with helpful items. An index to the species mentioned in the work would probably have been of general utility, and certainly a convenience to the reader.

ACULEATE HYMENOPTERA OF STAFFORDSHIRE.—This list, compiled by the Rev. F. C. Jourdain, enumerates one hundred and thirteen species as occurring in Staffordshire (Transactions of the North Staffordshire Field Club, 1903, pp. 81-87).

CAPTURES AND FIELD REPORTS.

ABERRATION OF LEPIDOPTERA.—With regard to Mr. Bellamy's report (*ante*, p. 243), I have also obtained the yellow variety of *Arctia caia*. I think, from my experience, and from information from friends, that this year will be found to have been very productive of varieties. I bred, from larvæ obtained in my garden here, a complete melanism of *Abraxas grossulariata*; the thorax is only slightly tinged with yellow. While at Eaglescliffe, in Durham, I got a series of *Triphana pronuba*,

with some beautiful variations of the fore wings. It seems to me that this abnormal amount of variation this year must be put down to the weather we have experienced, and I think it would be most interesting to have reports from the observations of other collectors on the subject.—WILLIAM BEATTIE; Glen Lodge, Mickleham, Surrey, Sept. 5th.

BUTTERFLIES IN HYDE PARK.—Walking down a sunny path in Hyde Park, on the Bayswater Road side, at mid-day on this hot day (Sept. 25th, 1903), my attention was attracted by a brilliant specimen of *Vanessa atalanta* on a clump of *Sedum spectabile* about two yards long. On stopping to watch it, I noticed hovering over the same bed, which was in full flower, two specimens of *Plusia gamma*, and innumerable flies and bees. What, however, surprised me most was to discover four specimens of *V. cardui*, lazily sucking the honey of the flowers, and sunning themselves with outstretched wings. On a sunflower was another specimen, and on a neighbouring bed of *Sedum* were two more. Of the seven specimens one had one wing chipped, all the other examples were in good condition, though not quite fresh.—JOHN C. WARBURG; 21, Pembridge Gardens, W., Sept. 25th, 1903.

LEUCANIA UNIPUNCTA, L. LOREYI, &c., IN SOUTH DEVON.—During a short holiday of twelve days in South Devon in the early part of September, I had the good fortune to capture one each of the above-mentioned rare British species, which, I think, is worthy of placing on record. *L. loreyi* was taken on Sept. 6th, flying wildly over rough herbage at dusk, and *L. unipuncta* came to sugared flower-heads on the night of Sept. 8th. I also took at sugar one *L. vitellina* on Sept. 9th, and one *Heliothis peltigera* on Sept. 14th. All were taken on the coast, and with these exceptions no other good things turned up, though, in spite of cold rough winds, some of the common species—such as *Agrotis suffusa*, *A. segetum*, *Noctua c-nigrum*, and *Phlogophora meticulosa*—appeared in abundance, the latter being simply a pest at sugar.—WILLIAM H. EDWARDS (Curator); "Hastings" Museum, Worcester Victoria Institute, Sept. 24th, 1903.

AGROTIS AGATHINA, A. PRÆCOX, AND A. VESTIGIALIS IN WORCESTERSHIRE.—On September 19th, my friend Mr. G. D Hancock and myself, when searching heather for larvæ of *Anarta myrtilli*, were fortunate enough to capture examples of the above species on a sandy, heather-covered common in Worcestershire. *Agrotis agathina* was somewhat worn, but still good enough for identification. Only one specimen of *A. præcox* was taken on this occasion, but another one was captured in July, 1901, at the same spot, by Mr. J. Peed. The appearance of such coast insects as *A. vestigialis* and *A. præcox* so far inland as Worcestershire, as well as *A. agathina*, which is new to our county list, seems worthy of recording.—WILLIAM H. EDWARDS.

MATURE LARVÆ OF ABRAXAS GROSSULARIATA IN SEPTEMBER.—I took a larva of this species about a fortnight ago, in the garden; it was then about half grown, and has just (Sept. 21st) spun up for pupation. There are many other larvæ of *A. grossulariata* in the garden, but the majority of them are quite small.—E. G. J. SPARKE.

PYRAMEIS CARDUI AND PLUSIA GAMMA IN SUFFOLK.—I thought you

would like to know that *P. cardui* is extremely abundant to the north-west of Ipswich, Suffolk, and probably all over the county. One clover field I passed through yesterday was alive with them, and hosts of *Plusia gamma*. Both species were worn.—ED. G. J. SPARKE; Sept. 25.

PYRAMEIS CARDUI IN TOOTING.—A fine specimen of *P. cardui* was flying about the garden here all yesterday. I have not seen the species here for some years, although larvæ used to breed regularly on the thistles in an adjoining field.—E. G. J. SPARKE; 1, Christchurch Villas, Tooting Bec Road, Tooting, S.W., Sept. 21st, 1903.

HELIOTHIS ARMIGERA AND PLUSIA MONETA AT LEWES.—A specimen of *H. armigera* occurred here on a street lamp on August 26th last. It was taken by Mr. Jarvis of this town, who has also during this season recorded the first example of *Plusia moneta* captured in Lewes.—HUGH J. VINALL; Lewes.

VAGARIES OF THE SEASON.—While beating nearly full-fed larvæ of *Abraxas sylvata* near Lewes on September 19th last with a friend, we were surprised to see a beautiful specimen of the perfect insect sitting on a leaf. We had taken this species in plenty during the first fortnight of July, and tattered specimens as late as July 25th, but had not seen the insect since. I have never heard of this species being double-brooded, but the fine condition of the insect taken pointed to its very recent emergence. The season has been marked by other vagaries. *Noctua plecta* and *Plusia gamma* were taken at sugar on April 6th, both very fresh, and apparently not hibernated specimens. This is also borne out by the fact that a larva of *Phlogophora meticulosa*, brought to me about January 10th, pupated, and, though kept in a cold room, emerged on March 14th. On the other hand, during the latter part of the season, some species have been very late, and a friend reports *Thyatira batis* at sugar in Kent as late as September 9th.—HUGH J. VINALL; Lewes.

[The season has undoubtedly been an erratic one, and many examples of its effect upon insect life must have come under the observation of our readers. It is to be hoped that other instances of abnormal dates will be recorded. We may mention that *Phlogophora meticulosa* has been previously noted as occurring in the moth state as early as February and as late as December. Full-grown larvæ of the species have also been found in January (Entom. xxxiv. 131).—ED.]

ABUNDANCE OF PYRAMEIS CARDUI.—The strong south-easterly winds which have been blowing continuously on this coast for the past four days have brought an immense number of this species across the North Sea. Two days ago not one was to be seen, but to-day, notwithstanding that there has been scarcely any sun, they were in hundreds everywhere. It is strange that they should be so plentiful, after the detestable weather that has done duty for the past summer both here, and, I believe, on the northern parts of the Continent also. These are not freshly hatched butterflies, as many of them are worn and torn; nor are they likely to be immigrants, for immigration, I think, as a rule, only occurs after a long continuance of hot weather, and when it is calm; they are simply wanderers blown across the sea, whether they wished it or not. *Plusia gamma*, of which only a few

were to be seen a day or two ago, was also swarming to-day, probably another case of enforced immigration.—GERVASE F. MATHEW; Dovercourt, Essex, Sept. 22nd, 1903.

I noticed a few hybernated specimens of this butterfly here in the early summer months, but owing to the miserable weather in July I did not examine thistles for the larvæ. No doubt there have been imagos about for the last week or two, but the first I noticed was on a Michaelmas daisy in my garden, yesterday. Imagine my surprise, then, when I saw at least fifty specimens of this beautiful insect disporting themselves on the flowers of *Sedum spectabile*, in the garden at Woodham, Mortimer Place, this morning. The *Sedum* is planted in a row some thirty yards long, to form the border of a flower-bed. Here and there among the *cardui* flashed out the vivid scarlet of *V. atalanta*, and there were simply hundreds of humble-bees and hive-bees, not to mention that common autumn imitator of the latter, *Fristalis tenax*. Truly a wonderful and magnificent sight, and long to be remembered.—(Rev.) GILBERT H. RAYNOR; Hazeleigh Rectory, Maldon, Essex, Sept. 21st.

SIREX GIGAS IN IRELAND.—A few days since, my son, Colonel Battersby, was cutting branches off a fallen pine-tree, when he perceived an unknown insect flying about, and secured it by knocking it down with his cap; it proved to be a female *S. gigas*—a beautiful specimen, with an enormously long ovipositor, and brilliant markings of velvety black and yellow.—FRANCES T. BATTERSBY; Cromlyn, Rathowen, West Meath, August. 21st, 1903.

PLUSIA CHRYSITIS.—I note Mr. Shaw's and Rev. Claxton's reply to my notes on this species (*ante*, p. 219). Although the species may be plentiful at Finchley and Romford, I am still of the opinion that such is not the case for this district. I have also lived near Farnborough (Kent), and at Ladywell, near Lee and Lewisham, and my experience has been the same in all these places. Strange to say, I captured a very fine specimen of this species at electric light here, shortly after the publication of my note—the *first* example that I have taken for four years; I also took another at bramble-bloom, in the New Forest, last month, on the 20th.—A. J. LAWRENCE; Anerley.

SPILODES PALEALIS IN SURREY.—On Aug. 14th last I had the pleasure of taking an example of *S. palealis* at Esher. Is not the appearance of this species in Surrey rather remarkable? I have always understood that it was confined to the coast of Kent.—ERNEST WARNE; 45, St. John's Hill, Clapham Junction, Sept. 14th, 1903.

APAMEA OPHIOGRAMMA.—On the third of this month my husband, while pulling up some weeds in the garden, disturbed a moth, which he brought to me, as it appeared to him to be uncommon. It proved to be *A. ophiogramma*, but in such poor condition that I let it go again. In the evening of the same day I took a fine specimen at dusk, and another on the evening of the 5th. We have noticed for some time that the patches of striped ribbon-grass (*Phalaris variegata*) have been dying off, and the probability is that the larva of this moth has attacked the roots and stems.—C. HOLMES; Ruthven, Sevenoaks, Aug. 25th, 1903.

[The larva of *A. ophiogramma* feeds on the ribbon-grass, and may be found, nearly or quite full grown, in the stem towards the root-stock. From the middle to the end of April is a good time to examine the plants; a withered or drooping blade usually indicates the presence of a larva.—ED.]

SPHINX CONVULVULI IN GLOUCESTERSHIRE.—A very fine and perfect specimen of this grand "hawk" was taken on September 11th at rest upon a stone wall in the parish of Whalley, near Blackburn, in the north-east of Lancashire, by Master Eric Jacques. The insect was brought to me by its boy captor for identification, very fortunately, as he had no appliances for setting.—CANON NASH; Standish Vicarage, Stonehouse, Glos.

SPHINX CONVULVULI AT SCARBOROUGH.—To-day one of the workmen employed by Mr. Collier, florist of this town, brought me a fine *Sphinx convulvuli* in perfect condition, which he told me he had just found on the under side of a coping-stone.—F. D. BLAND; 35, Avenue Victoria, Scarborough, Sept. 9th, 1903.

SPHINX CONVULVULI AT LOWESTOFT.—This evening I was attracted by a number of people in London Road gazing apparently at an electric light; on going up to see what was the matter, I saw a huge moth flying slowly round the light. I at once recognized it as *Sphinx convulvuli*. The puzzle was how to catch it without damage. There was none of the usual dash about its flight, but I had nothing with me, not even a box. Fortunately it partially solved the difficulty, for it flew down on to the pavement, and I immediately put my cap gently over it, and then carefully uncovering, I seized it with the finger and thumb. I carried it two or three hundred yards to a friend's house with scarcely any damage to the insect. There I transferred it to a large inverted tumbler, and thence to a suitable box. Showing how tenacious of life these creatures are, I may say that after being in the box for three or four hours, in which was a piece of cotton-wool saturated with prussic acid, it was still alive; it then spent the night in an old cyanide bottle, by no means inert, and was alive in the morning, when I finished it with fresh cyanide. It measured full five inches in expanse.—J. E. CAMPBELL-TAYLOR; Lowestoft, Sept. 12th, 1903.

LEPIDOPTERA IN AUGUST AT BROCKENHURST.—I spent the first two weeks in August at Brockenhurst. The weather for the first two days was fine, but later it was rather dull, rain being frequent. On the whole, however, I think I had an enjoyable and profitable holiday. On arriving at Brockenhurst, I found out Mr. Morris, and arranged with him to show me round during my stay. Most of the time was occupied with larvæ-beating and searching. Amongst other larvæ were *Vanessa atalanta*, *V. io*, *Apatura iris* (one small one was beaten from sallow), *Macroglossa fuciformis*, *Euchelia jacobæ* (extremely abundant, almost every plant of ragwort had several larvæ feeding on it), *Halias prasinana*, *Lithosia sororcula* (*aureola*), *Dasychira pudibunda*, *Psilura monacha*, *Stauropus fagi*, *Lophopteryx camelina*, *Orgyia antiqua*, *Notodonta dromedarius*, *N. trimacula* (*dodonea*), *Phalera bucephala*, *Moma orion*, *Demas coryli*, *Acronycta alni*, *Amphidasys betularia*, *A. prodromaria*,

Tephrosia consonaria, *Boarmia consortaria*, and other miscellaneous larvæ. Amongst butterflies were the following:—*Pieris brassicæ*, *P. napi*, *P. rapæ*, *Gonepteryx rhamni* (abundant and very fine), *Argynnis paphia* (abundant, but in poor condition); several var. *valesina* were seen. *Vanessa urticæ*, *V. polychloros*, only one specimen was seen. *V. io* was just coming on the wing. *Limenitis sibylla*, abundant, but very worn. *Pararge egeria* and *P. megara* were plentiful, and very fine. *Satyrus semele*, abundant on the heaths. *Epinephele ianira*, *P. tithonus*, and *Aphantopus hyperanthus* were common. *Cænonympha pamphilus*, *Chrysophanus phlæas*. *Lycæna ægon*, abundant and fine. *Hesperia thauinus* and *H. sylvanus* were common. Sugaring proved a failure, only a few species being taken. *Thetis detersa*, *T. batis*, *Catocala sponsa* (one in perfect condition), *Gonoptera libatrix*, and a few others. Several *Sarothripus undulatus* were taken, being beaten from oaks during the day. *Melanthia albicollata*, *Eubolia palumbaria*, *Selidosema ericetaria* (*plumaria*), *Lophopteryx camelina* (two were attracted to our lantern whilst sugaring), and several *Porthesia similis* (*auriflua*); this moth was very common.—JOHN WRIGHT; Woolwich.

SOCIETIES.

SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—June 25th, 1903.—Mr. E. Step, F.L.S., President, in the chair.—Mr. Councillor Newberry, of East Greenwich, was elected a member.—Mr. Turner exhibited living imagines of *Coleophora nigricella* from Benfleet, and of *C. fuscicollata* from Dumbartonshire.—Mr. Jäger (1) examples of *Papilio polydamas* from South Texas; (2) a larva of *Chelonia plantaginis* which had been attacked by a worm, probably *Gordius aquaticus*; and (3) a large *Tarantula* sp.? from India.—Mr. Enock, a very large species of ichneumon which he had just bred from a larva of *Eumorphia elpenor* found at Woking.—Mr. West (Greenwich), a series of a very local species of Rhyncophora, *Polydrusus chrysomela*, taken on *Chenopodium* near Gravesend.—Mr. R. Adkin gave a report of the Annual Congress of the S.E. Union of Scientific Societies which had just been held at Dover.

July 9th.—The President in the chair.—Mr. West (Greenwich) exhibited several species of Hemiptera taken by Mr. Ashby at Deal, including *Podops inuncta*, *Siocoris cursitans*, *Pseudophlæas falleni*, *Rhyarochromus prætectatus*, *R. chiragra*, and *Aphanus lynceus*. He also showed, from Horsley, *Eysarcoris melanocephalus* and *Gnathoconus albomarginatus*, and the following Coleoptera, *Apion malvæ* from near Gravesend, *Hæmonia curtisi*, *Cercyon littoralis*, and *C. depressus* from the shore at Yarmouth.—Mr. Sich, a living example of *Geometra vernaria*, which he had just captured at Chiswick.—Mr. Turner, cases with living larvæ of *Coleophora calibipennella*, which Mr. Chapman had just sent to him from Spain, and living imagines of *C. limosipennella* from Lewisham, and of *C. cæspititiella* from Loughton, both bred from larvæ.—Mr. Lucas reported that a number of examples of the dragonfly *Æchna isosceles* had recently been taken in the eastern counties.

July 23rd.—The President in the chair.—Mr. McArthur exhibited (1) three examples of female *Argynnis aglaia* of a very unusual size, the largest measuring 74 mm. in expanse; (2) a male with enlarged black markings; (3) *Epinephele ianira* with considerable xanthic markings. They were all from Brighton.—Mr. Tongé, (1) *Heliaca tenebrata* (*arbuti*) from Nutfield Marsh; (2) the sawfly *Pamphilius flaviventris* bred from a larva found in Tilgate Forest feeding on black-thorn in Aug. 1902.—Mr. Sich, ova of *Geometra vernaria* laid by a female captured at Chiswick.—Mr. Clark, a specimen of *Capsus laniarius* just taken in his garden. It was noted as frequently appearing among cultivated flowers.—Mr. Ashby, series of *Limobius mixtus* and *Lixius bicolor* from Deal in June, and a specimen of *Polystichus vittatus* from Walmer; all local species.

August 13th.—The President in the chair.—Mr. Goulton, (1) a short series of *Hypsipetes sordidata* (*elutata*) from Ranmore Common, including a bright green very black-barred form, and a wholly dusky form; (2) a short series bred from ova of the above, and stated that all the bred specimens were lighter than the captured ones; (3) a yellow form with yellow eyes, from the Isle of Wight.—Mr. F. M. B. Carr, a large number of species of Coleoptera taken at Salisbury and in South Devon.—Mr. Ashby, series of the local species *Harpalus caspius* and *H. sabulicola* from Portland in June.—Mr. McArthur, *Cossus cossus* (*ligniperda*), one of a number seen around the electric light in King's St., Hammersmith.—Mr. R. Adkin, a bred series of *Eupithecia exigua* from Brighton; one-half of the larvæ were fed on sallow, and the other on ash.—Mr. West, of Greenwich, the three British representatives of the genus *Acalles*, taken at Darenth Wood by beating dead oak twigs in July.—Dr. Chapman, (1) nearly full-fed larvæ of *Nisoniades tages* from ova laid on *Lotus corniculatus*; (2) a larva of *Orgyia splendida* from Spain, and pointed out its differences from *O. antiqua*; (3) a living example of *Parnassius apollo* from Spain exactly like the usual Swiss form, and characteristic of the district of Spain he had just visited.—Mr. H. J. Turner, (1) larvæ of *Phibalapteryx tersata* from ova laid by a female captured at Wendover on July 11th; (2) larvæ of *Spilosoma fuliginosa* from ova, and remarked on the irregular way in which they were feeding.—HY. J. TURNER, *Hon. Rep. Sec.*

BIRMINGHAM ENTOMOLOGICAL SOCIETY. — June 15th, 1903.—Mr. R. C. Bradley, Vice-President, in the chair.—Mr. W. H. Wilkinson showed a box of Folkestone Lepidoptera, also a small collection made on the Riviera.—Mr. R. C. Bradley, a few bees taken at Ventnor, Isle of Wight, early this year—*Halictus quadricinctus*, F., *Andrena nigroænea*, Kirb. ? (a stylopized male), *A. fulvicrus*, Kirb. (a nice series), *A. atriceps*, Kirb., *A. pilipes*, F. (one).—Mr. J. T. Fountain showed *Leptidia sinapis*, L., from the Wye Valley; one was a remarkable variety; apparently every scale which should have been black was changed to a dull orange colour, the wing markings at the tip, &c., all being of this colour. He also showed *Bomolocha fontis*, Thnb. (*crassalis*, Tr.), from the Wye Valley, and *Boarmia luridata*, Bork., and *Bapta temerata* (S. V.), Hb., from Trench Woods.—COLBRAN J. WAINWRIGHT, *Hon. Sec.*

OBITUARY: J. H. FOWLER.

It is with very sincere and deep regret that I record the death of my friend JOHN HENRY FOWLER, on August 11th last, at the comparatively early age of forty-seven years. For some months previously he had been in indifferent health, and although generally uncomplaining, yet his appearance indicated something wrong. A rest and change were recommended by his medical advisers, but having spent a month or more in his native Devonshire, he returned rather worse than better. For a short time after returning he attended business as cashier at the National Provincial Bank in this town, where, for the past fourteen or fifteen years, his quiet, obliging and unassuming—but business-like—demeanour made him a general favourite. Sheer exhaustion at last compelled him to give up, and a specialist having been summoned from a distance, pronounced his case hopeless. A complication of disorders, not the least of which was the terrible Bright's disease, caused him fearful agonies for weeks previous to his decease, but the end was peaceful.

Fond of Nature in all her varied phases, it was as an enthusiastic entomologist he was best known, and his keen powers of observation and perception were exercised wisely and well; whilst, as a worker in the field, few collectors were more expert and assiduous; in fact, he seemed possessed of indomitable energy—in some instances, I fear, far beyond his failing strength, a characteristic often remarked by those who had the pleasure of collecting with him. During his residence at Ringwood he became well acquainted with the grand old forest and its many treasures, and being no arm-chair naturalist, his knowledge of the habits and life-histories of many Lepidoptera was extensive, as the pages of this journal bear testimony.

Perhaps he excelled more particularly in the detection of varieties (Entom. 1893, p. 29; and Entom. 1894, p. 131); and it may be remembered that, a few years ago, a variety of *L. corydon* was named after him. In the same year British *Emydia cribrum* were deemed worthy of a distinctive name, after an examination of his long and almost unique series of that local species; and I believe that this was not the only Lithosid to which he paid particular attention, and secured many specimens of marked variation. He, too, had the good fortune to capture the remarkable variety of *Argynnis aglaia*, which, if not "*charlotta*," is a most interesting form, and is figured in the 'Entomologist' for 1894, p. 182. In the conversations we frequently had, recollections of my old collecting experiences often returned most vividly, especially when he talked of rearing the yellow form of *Callimorpha dominula*, or the difficulties met with in bringing through such species as *Cymatophora ridens*, *Tæniocampa miniosa*, *Agrotis agathina*, and others.

He was interred in the Ringwood cemetery on August 15th, and leaves a widow and three daughters to mourn his loss.

G. B. CORBIN.

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DESCRIPTION OF A NEW LONGICORN BEETLE FROM BRITISH EAST AFRICA.

By E. A. HEATH, M.D., F.L.S.



ZOGRAPHUS BALTEATUS.

Shining black. Pronotum thickly transversely striate, with a narrow elongate transverse cream-coloured spot on each side of base. The head is rugose, except in front, where it is smooth opaque. The antennæ in the male are about half as long again as the body. The basal joint is stoutest, slightly longer than the head, and coarsely granulated, the second joint being smoother, and twice as long as the first; the remaining joints shorter than the second, and almost subequal in length. The elytra are thickly and coarsely punctured, and obscurely pilose. The humeral angles are rounded and crenulate, with an obtuse tooth at its apex. A discal wavy longitudinal carinate line, commencing near the posterior angle of the pronotum and terminating before apex somewhat near the elytral suture. Four rounded

cream-coloured spots with reddish centre, two on each elytron ; one a little before centre, near suture ; the other near base, on the lateral margin. The body beneath, and the legs, somewhat longly pilose, with a transverse oval cream-coloured spot, and a smaller spot near its base, at the junction of the pro- and mesosternum ; and two somewhat similar spots at the posterior margin of the mesosternum. The legs have a patch of light-coloured hairs on the upper and anterior edge of the femora, near base. The tibiae are fringed with lightish hair on their posterior margins. Long. from head to apex of elytra 12 lines. Max. lat. 5 lines.

Hab. British East Africa.

PYRAMEIS CARDUI, PLUSIA GAMMA, AND NEMOPHILA
NOCTUELLA.

By ROBERT ADKIN, F.E.S.

THE number of dull, rainy, or otherwise bad days during the month of September, 1903, rendered anything like a continuous record of the doings of so sun-loving a creature as *Pyrameis cardui* being kept ; but such fragmentary notes as I was able to make regarding its appearance at Eastbourne during my stay there may be of some interest when taken in conjunction with other published observations.

Sept. 10th will long be remembered for its storm ; the fresh westerly breeze of the morning southerened a few points during the later part of the day, and as night approached increased to a violent hurricane ; the spray-laden wind swept along the coast, utterly destroying the more tender foliage, and even some miles inland the exposed sides of trees and hedges were browned and shrivelled as though they had been scorched ; and its effect on insect life on our south and east coasts must have been equally disastrous. This was followed by fairly fine weather with calms and slight airs until the 17th, when a south-east breeze set in, and by the 19th had backed to east-south-east, and was blowing freshly, and so continued until the 21st.

Up to the 20th I had seen neither *cardui* nor *gamma*, but on that day I noticed one of the former and several of the latter feeding at the flowers planted in the gardens along the parades. On the 21st one *cardui* and increased numbers of *gamma* were seen in the same situation, and during a walk on the higher inland downs in the late afternoon the latter-named species was flying in great numbers, and feeding freely at bramble-blossoms, but no concerted flight in any particular direction was observable. The 22nd was overcast, with drizzly rain ; on the 23rd a sea-fog obscured both land and sky, and on the 24th it still hung over the land, but less densely. Despite these adverse conditions,

gamma was frequently seen about the flower-beds, and on the last-named date I kicked up a single example of *Nemophila noctuella* from a bit of rough grass at the end of the parade. The fog had melted away to a light haze on the 25th, with an overcast sky, and, although there was no bright sunshine, *cardui* were seen about the gardens by the sea.

The morning of the 26th broke dull, but by nine o'clock the sun was breaking through, and I lost no time in making my way to the sheltered hollows under Beachy Head, where, if any butterflies were to be found, I should surely find them. By the time I arrived there the sun was shining brilliantly, the lightest air drifted in from the sea, and the morning was positively hot. Such butterflies as one usually expects to find abundantly in this spot were, however, by no means so; *Lycæna corydon*, for instance, was represented by less than a score of individuals, and *Epinephele ianira* was seen to about the same number during the couple of hours that I spent there; but there was no lack of *cardui*, it was distinctly the most common butterfly, and was surpassed in numbers only by *gamma*, whose continued hoverings were simply bewildering, and *noctuella*, which rose from the grass at every step one took. Many of the *cardui*, as they fed at the knapweed-flowers or sat sunning themselves on the bare patches of ground, looked delightfully bright and fresh, but on catching several of them the wear of flight was only too apparent in the thinness of their scaling, and generally dull appearance when shaded from the bright sunlight. Even on this bright day an occasional wreath of fog would drift across, and during its passage not a wing was to be seen; even *gamma* would seek shelter until it had passed. This was my last chance of any extended observation, for on the next morning rain was falling, and, with the exception of the 30th, when I unfortunately had to be away, dull or rainy weather continued until my return on Oct. 2nd.

Several notes have already been published dealing with the appearance of *cardui* and *gamma* this autumn, and Mr. Barker has very kindly allowed me to see his remarks before publication. On comparing the dates given with the time when the south-east wind was prevalent, one cannot fail to be struck by the way in which they coincide. Thus, the wind became east on the 17th, and on the 18th the first *cardui* was reported (at Yarmouth); the wind freshened during the next few days, and *cardui* increased in numbers, and on the 21st eight examples were seen from a steamer between Yarmouth and Walton making their way towards the land. From the 21st to 26th the species was found in abundance at places on the coast so far apart as Suffolk and Sussex, and by this time some few had found their way as far inland as London, and this under conditions of weather that were by no means favourable for the movement or for the observation of a

species that without bright sunshine is very likely to be overlooked.

The appearance of *gamma* coincides very closely indeed with that of *cardui*, and the abundance of *noctuella* above referred to is a factor that must not be disregarded. Both *cardui* and *gamma* are known migrants, and there is good reason for believing that *noctuella* should be included in the same category. Such evidence as we have with regard to this autumn's visitation may confirm Mr. Mathew's suggestion (*ante*, 267) so far as concerns the immediate cause, but we must look much further than the mere prevalence of easterly winds in our immediate neighbourhood for the primary cause, and I think the true solution will be found in the migratory habits of the species in question.

Lewisham : Oct. 17th, 1903.

PLUSIA NI AT PENZANCE.

By WILLIAM DAWS

(Late Curator of Porth Enys Museum).

I WAS interested in seeing Dr. Knaggs's account of this insect at Lynwood, near Penzance (*ante*, p. 217). The reason the late Mr. Baily did not make the matter known through the entomological magazines was that it had been hinted that he had introduced the species, and this caused him a great deal of annoyance. He told me he should keep quiet until someone opened the subject; then he would discuss it with them. I wish Dr. Knaggs had published his note sooner, as it would have given Mr. Baily a chance to place the facts before the public. *P. ni* was first taken at Lynwood by Mr. W. Beeton, who was staying there on a visit; he did not know anything about entomology, so used to bring in anything in that line that he found. I do not remember the number that was bred from larvæ brought in by the workmen; Mr. Baily gave a reward to them for each *P. ni* reared. Each man had a separate breeding-cage, with his name on; they collected all the green larvæ they could find feeding on the cabbages in their gardens. Some of the gardens were three-quarters of a mile from one another. Mr. Baily supplied several friends and collectors with specimens. I believe a pair that he gave to Mr. C. Briggs was sold at Stevens's for £4 1s. Through the kindness of Mr. Baily I have a series of four in my collection. The gamma-like mark in *P. ni* varies in size and definition. The larva of *P. ni* can easily be separated from that of *P. gamma*: it has a more slender appearance than the larva of *P. gamma*. The cocoon is quite white, and the pupa is black and not so robust as the pupa of *P. gamma*. Mr. Baily did not make a collection of pupa-cases or cocoons, so no care was taken of them; but I have

three mutilated cocoons and pupa-cases from which some of the *P. ni* were bred. I believe the reason it was said that *P. ni* had been planted was due to the fact that either Dr. Knaggs or Mr. Baily sent for a foreign example of *P. ni* for comparison; but how was it possible to plant colonies of *P. ni* in several places from a dead example? Perhaps Dr. Knaggs could tell us who sent for that foreign example of *P. ni*. I think it came from Edmonds, of Windsor. I have this specimen also in my collection.

[Dr. Knaggs informs us that he wrote to Edmonds for a continental specimen of *P. ni* for comparison with the Penzance examples.

It may be interesting in this connection to quote Mr. Barrett's remarks on the history of British *P. ni*. He writes ('British Lepidoptera,' vi. 130):—"It is very little known here, and is apparently one of our rarest species, but there are rumours that it is not so scarce in the far west of England. The first specimen recorded in this country was captured flying about blossoms of red valerian by Mr. D'Orville in his garden at Exeter in August, 1868. The next was taken by Miss Carne, of Penzance, hovering at flowers in her garden in May, 1869, and was recognized by Mr. W. R. Jeffrey, in whose collection it still is. Of further captures in the same district, in both imago and larva state, definite information has been refused. The third recorded specimen was taken in Dorsetshire by Mr. Nevinson in 1885, and the fourth at the Isle of Portland, in the same county, in September, 1888, by Colonel Partridge, to whose lamp it was attracted while he was sugaring. In 1894 Mrs. Richardson found two larvæ in the same locality, from which the moths were reared early in September; and in the same year Mr. C. A. Briggs was allowed to exhibit two of the mysterious Cornish examples. The last of which I have any reliable information is a specimen taken sitting upon a fence at Norbiton, Surrey, in May, 1896, by Mr. Percy Richards; but there is a specimen in Dr. Mason's collection which may safely be held to be British, since it was found, overlooked, among a lot of the allied *P. gamma* in a British cabinet."

The American *Plusia brassicæ*, considered by Dr. Knaggs to be specifically identical with *P. ni*, and in this opinion we concur, is regarded as a pest in many parts of the United States. It was known to be seriously destructive to cabbages and other cruciferous plants in the Southern States some time before it was named and described by Riley in 1870. Since that time it seems to have extended its range north as far as Illinois and New Jersey. American entomologists state that the species is probably of somewhat remote southern origin. *Brassicæ* is rather larger in size and browner in colour than *ni*, and it would be interesting to know which form the Penzance specimens are referable to, as this might afford some clue to their origin.—ED.]

DESCRIPTIONS OF FOUR NEW SPECIES OF *VESPA* FROM JAPAN.

By P. CAMERON.

THE four species here described were taken by Mr. George Lewis in Japan. I have had them marked as being undescribed for some years.

VESPA TRIDENTATA, sp. nov.

Black; the wings dark fuscous, with a violaceous tinge; the costa black, the nervures and stigma dark fuscous; the head, mandibles, the apices of abdominal segments one to five, and the whole of the sixth rufous; the hinder part of the vertex and the upper part of the outer orbits with an orange tinge. Antennæ black, the scape rufous, the flagellum brownish beneath. Legs black, the apex of the fore femora and their tibiæ rufous. ♀. Length, 25 mm.

Hab. Japan.

Head large, slightly wider than the thorax; the malar space distinct, moderately large; frontal plate wider than long, becoming gradually roundly narrowed to the apex, its base transverse, its centre with a narrow furrow. Clypeus strongly and closely punctured, its apex in the centre ending in a small, rounded, smooth tooth, with a much broader, longer, rounded one on either side. Mandibles rufous, the apex and teeth black; they are closely and strongly punctured. The hair on the head is fuscous, paler on the clypeus. Head and thorax covered with long dark hair. The apex of the prothorax dark rufous. The bands on the abdomen are broad and extend on to the ventral segments.

This species come close to *V. magnifica*, Smith, but that species is larger, the temples are longer compared with the eyes, the malar space is larger, the frontal area longer and more sharply pointed at the apex, and the reddish bands on the abdomen are much narrower.

Mr. Lewis captured at Hitoyoshi a queen *Vespa* which forms a well-marked variety of *V. magnifica*, var. *latilineata*, Cam. It is larger by 6 or 7 mm. than any of the recorded examples of *magnifica*; the bands on the abdomen are much wider, and the basal two segments are also broadly banded at the base. In having broad abdominal bands this variety agrees with *V. tridentata* here described, but the different form of the clypeus distinguishes that species.

VESPA XANTHOPTERA, sp. nov.

Fulvous, tinged in places with yellow, the vertex from shortly behind the ocelli to the frontal plate, a line on the sides of the latter and a broader one below the antennæ, the occiput, mesonotum, a line on the centre and apex of the scutellum, the pleuræ, the metanotum, except the sides from near the top, the basal slope of the first abdominal segment, the mark narrowed in the centre and united to a broad

transverse band, the second segment to shortly beyond the middle, the band with an irregular border on the apex, a broad band on the third, and a narrower one on the fourth, black. Legs coloured like the body, the anterior femora at the base below, and the four hinder coxæ, trochanters, and femora, black. Antennæ broadly black above, the scape yellow, the flagellum brownish below. Wings yellowish hyaline; the costal nervure black, the others fulvous. ♂. Length, 24 mm.

Hab. Michzusawa.

The entire insect thickly covered with long fulvous pubescence. Clypeus distinctly punctured, its length as long as the width at the apex, which is transverse; in the centre are three rufous marks in a triangle. The mark on the top is widened laterally and upwards, the centre slightly dilated. The black mark on the vertex is transverse behind, rounded in front. Mandibles with a distinct greenish tinge. Pronotum fulvous, as are also the tegulæ. The black lines on the abdomen are slightly dilated in the middle at the apex. Ventral surface for the most part blackish, the sides with paler marks; the penultimate segment is roundly incised in the middle, the incision slightly broader than long and extending to shortly behind the middle; the last segment is incised from side to side, the incision reaching to the middle; the last dorsal segment is slightly incised at the apex. Malar space moderately large.

Allied to *V. micado* and *auraria*. Characteristic is the form of the frontal plate, which does not become gradually narrowed towards the apex, but is broad and transverse there. The apex of the clypeus, too, is transverse, not incised as in the two species just mentioned. The male of *auraria* is not described by Bingham, but Saussure ('Vespidæ,' ii. 147) describes it "comme la femelle," so it should, apart from its smaller size, be easily separated from my species.

VESPA MICADO, sp. nov.

Rufo-fulvous, the ocellar region—the black in front reaching to the frontal plate, and only slightly developed behind the ocelli—the mesonotum, except for two lines extending from the base to shortly beyond the middle, the furrow on the scutellum, its apex, the base and centre of the post-scutellum, the base and centre of metanotum, the basal slope of the first abdominal segment, an interrupted transverse line near its base, and a broader one, dilated in the centre behind, near its apex, black. Front thickly covered with long black hair, the hinder part of the vertex and the thorax thickly covered with long fuscous hair. Wings fuscous-violaceous, the costa black, the nervures lighter coloured. ♀. Length, 27 mm.

Hab. Nagasaki.

Clypeus closely punctured, more strongly below than above, its apex with a slight broad incision, its sides broadly rounded. Frontal plate nearly as long as its width at the base; it becomes gradually roundly narrowed to the apex; the black mark is incised in the middle at its base. The clypeus and mandibles have a yellowish hue, the mandibular teeth and apex black. Antennæ coloured like the body,

the scape slightly darker coloured than the flagellum. Temples slightly dilated from the base to the apex.

This species comes close to *V. bicolor*, but the colour is darker, more rufous, without any yellow tint; it is much larger and more robust; in *bicolor* the antennæ are black above, the upper part of the front, the vertex entirely, and the occiput are black; the frontal mark is transverse above, the clypeus is longer compared with its width, and the incision on its apex is deeper; the wings are clearer, more hyaline, and the pubescence darker. In the ground colour my species more resembles *auraria*, but that species is smaller, wants the black frontal mark, has the thorax for the greater part blackish, and the four hinder legs for the greater part black; also there is no yellow tinge on it.

VESPA FLAVO-FASCIATA, sp. nov.

Head orange-yellow; the occiput, except round the edges, a mark on the ocellar region, extending from shortly behind the ocelli, half-way down the front, the mark roundly narrowed before and behind; it is thickly covered with long blackish hair. Clypeus closely and strongly punctured, its apex roundly but not deeply incised; the sides are more deeply incised. Mandibles coloured like the head, with the teeth black. Frontal plate broadly rounded at the apex and furrowed down the middle. Thorax deep black, the pronotum dark rufous; the whole thorax is thickly covered with long dark fuscous hair. Abdomen sparsely covered with longish hair; the basal slope of the first segment black, the rest brown, darker on the apical half; the apex with a narrow yellow line; the basal two-thirds of the second brown, darker at the base, the apex slightly dilated in the middle; the base of the third is similarly coloured to shortly beyond the middle; the middle of the black band is produced to the base of the apical third, is obliquely narrowed, and has a rounded point on either side of the dilated middle, the rest being yellow; the other segments yellow, except that the fourth and fifth are narrowly brownish at the base, with a rounded projection on the sides; the second to fourth ventral segments are yellow at the sides, the blackish basal part projecting there as irregularly rounded knobs; the last segment is entirely yellow. Legs black, the apex of femora, tibiæ, and tarsi dark testaceous; the hair on the femora is long and black. Antennæ dark rufous. Wings hyaline, darker in the costal cellule; the nervures dark testaceous. Tegulæ dark testaceous. ♀. Length, 24 mm.

Hab. Nügata (Shinanogawa).

Comes near to *V. crabroniformis*, Sm., and *V. mongolica*, André. It has also some affinity with *V. crabro*.

Mr. Lewis has taken some specimens of a wasp which is clearly *V. japonica*, Saussure, non Sm. non Rad. This is the species, Col. Bingham tells me, which Smith (Trans. Ent. Soc. 1873, p. 198) quotes as *V. lewisii*, Saus. MS. *Vespa japonica*, Rad., is identical with *mandarinia*, Sm. Smith's *japonica* I do not know, and the name is not admissible, it being later than

Saussure's, which was described in *Rev. et Mag. de Zool.* (2), x. 1858, p. 261. The species recorded or known to me from Japan are:—*auraria*, Sm., = *simillima*, Sm.; *cincta*, Fab. (George Lewis); *crabroniformis*, Sm.; *ducalis*, Sm.; *flavo-fasciata*, Cam.; *japonica*, Saus.; *japonica*, Sm., non Saus.; *magnifica*, Sm., var. *latilineata*, Cam.; *micado*, Cam.; *mongolica*, André; *norwegica*, Fab.; *siberica*, André; *tridentata*, Cam.; *xanthoptera*, Cam.; or fourteen species in all. Thirteen species of *Vespa* are recorded by Bingham from British India, but to these must be added *V. germanica*, Fab., which I have seen from the Khasias. Thus the number for both regions is the same. *V. affinis*, F., and *V. bicolor*, F., probably extend into Japan.

TWO NEW JAMAICAN CULICIDÆ.

BY FRED. V. THEOBALD, M.A.

THE following descriptions of two new mosquitoes are drawn up from specimens sent to the British Museum (Nat. Hist.) by Dr. Grabham, and taken by him near Kingston. The new *Culex* is very distinct, as also is the *Hæmagogus*, which is so far the most beautiful Jamaican mosquito yet found. The type-specimens are in the Museum collection.

Genus CULEX, Linn.

(Syst. Nat. 1735; Theob. Mono. Culicid. i. p. 326, 1901.)

Culex tortilis, n. sp.

Head golden scaled; proboscis unbanded; thorax adorned with golden scales, and a large dark brown patch on each side in front, the back of the mesonotum also darkened; pleuræ with grey scales. Abdomen deep brown with violet reflections; the second, third, fourth and fifth segments with narrow basal pale bands; venter pale yellow scaled. Legs deep brown, unbanded; venter of femora and coxæ white. Ungues equal.

♀. Head brown, clothed with narrow-curved golden-yellow scales, a few black bristles, and ochraceous upright forked scales; proboscis and palpi deep brown; antennæ brown; basal joint testaceous; second joint very large and swollen, deep brown. Thorax deep brown, the middle of the mesonotum clothed with narrow-curved golden scales; on each side in front a roundish rich deep brown patch, and the posterior part of the mesonotum with darker scales than the front, being almost brown, but not so dark as the front lateral areas; scutellum with dull golden-brown scales and brown border-bristles; metanotum bright chestnut-brown; pleuræ pale brown, with spots of grey scales. Abdomen black in some lights, rich deep but dull violet in others; the first segment with dusky scales, forming two spots and pale golden hairs; the second, third, fourth and fifth segments with narrow pale yellowish basal bands, not extending quite across the

segments, the fifth sometimes very inconspicuous; basal lateral white spots most prominent on the apical segments; venter clothed with creamy yellow scales; border-bristles of the dorsum pale golden. Legs deep brown, except the coxæ and venter of the femora, which are grey to creamy yellow; femora, tibiæ, and hind metatarsi with black bristles; hind metatarsi very nearly as long as the hind tibiæ; fore and mid ungues equal, uniserrated; hind equal and simple. Wings clothed with typical brown *Culex* scales; fork-cells rather short; first submarginal cell very slightly longer, but narrower than the second posterior cell, its stem about as long as the cell, its base about level with the base of the second posterior cell, if anything slightly nearer the apex; stem of the second posterior cell not quite as long as the cell; posterior cross-vein very short, about twice its own length distant from the mid; a pale spot at the base of the wing; halteres testaceous. Length 4 to 4.5 mm.

Hab. Kingston, Jamaica.

Time of capture. August.

Observations.—Described from a series of females taken by Dr. Grabham. They are very distinct, small, thick-set mosquitoes, easily told by the thoracic adornment, the two dark spots on the front of the mesothorax being very characteristic; their unbanded legs at once separate them from *Culex secutor*, Theob., or *C. janitor*, Theob., and they are of much stouter build. When alive they can easily be identified by the character noticed by Dr. Grabham, of carrying their hind legs twisted right forward over their head, when settled, after the manner of *Wycomyias*. There is some variation in the venation. Some specimens show the base of the first submarginal cell slightly nearest the apex, and the posterior cross-vein as long as the mid cross-vein, and about its own length distant from it. In others the basal abdominal banding is very faint; in one there is a trace of an additional basal abdominal band.

Genus *HÆMAGOGUS*, Williston.

(Trans. Ent. Soc. Lond., 1896, p. 271, Williston; Mono. Culicid. ii. p. 238, Theob.)

Hæmagogus equinus, n. sp.

Head metallic violet, white between the eyes in front; palpi and proboscis black; antennæ pale brown. Thorax metallic green; pleuræ snowy white. Abdomen bright metallic violet, with three prominent and one faint silvery white basal bands and white lateral spots. Legs unbanded, deep brown; femora white beneath. Wings with violet reflections, iridescent.

♀. Head clothed with flat metallic violet scales, except a patch between the eyes, which are white, and at the sides, where they are grey and black; black bristles project over the eyes, and there is a trace of a narrow pale border surrounding them; clypeus with a frosty sheen; palpi black; proboscis black, curved upwards, nearly as long as the whole body; antennæ pale brown, basal segments deep brown,

with dusky scales on the large basal and second segments. Thorax black, covered with large flat apple-green metallic scales, rounded at their apices and irregularly disposed over the mesonotum; a patch of almost silvery white ones just in front of the roots of the wings, with also long dense black bristles; scutellum with flat green and blue scales and black border-bristles; prothoracic lobes and pleuræ silvery white. Abdomen rich metallic violet; the first segment with an oblique white line on each side; the second and third unadorned; the fourth with a few large basal white scales; the fifth, sixth and seventh segments with basal white bands; border-bristles short, black; each segment with a large basal silvery white lateral spot; venter pure silvery white; each segment with a median black spot, the last two segments projecting downwards, and giving the appearance of two ventral black tufts. Legs unbanded, deep brown, with metallic violet reflections; and a pale knee spot to the mid and hind pair; femora white beneath; unguis small, equal, and simple. Wings faintly tinged with brown, metallic violet and iridescent in certain lights; first submarginal cell slightly longer and narrower than the second posterior cell, its base nearer the apex of the wing, its stem longer than the cell; stem of the second posterior longer than the cell; posterior cross-vein rather more than its own length distant from the mid cross-vein; halteres with ochraceous stem and fuscous knob. Length, 4-5 mm.

Hab. Kingston, Jamaica, W.I.

Time of capture. August (24th).

Observations.—Described from a single perfect specimen. Dr. Grabham took this brilliant species feeding on a horse. He took two specimens, and mentions that "it is by far the most brilliant species found here, and evidently uncommon." It was taken at 7 p.m. at the lower end of Old Pound Road. It resembles *H. cyaneus*, Fabricius, but the venation is different, the first submarginal cell being smaller, and having its base nearer the apex of the wing, whilst in *cyaneus* it is nearer the base; moreover, the abdomen is adorned. It also approaches *H. albomaculatus*, Theob., but the abdomen has not the curious chætotactic characters seen in that species (*vide* fig. 171, p. 309, Mono. Culicid., vol. iii.) and is banded, not having the two median spots seen in *albomaculatus*.

The three species of *Hæmagogus* tabulate as follows:—

- A. Abdomen unadorned. Base of first submarginal cell nearer base of wing than the base of the second posterior cell . . . *cyaneus*, Fab. = *splendens*, Willis.
- AA. Abdomen adorned.
 - a. Base of first submarginal cell nearer apex of wing than that of posterior cell.
 - b. With prominent chætæ and two median basal white spots . . . *albomaculatus*, Theob.
 - bb. No prominent chætæ, but basal white bands and a white oblique stripe on each side of first segment . . . *equinus*, Theob.

A LIST OF THE LEPIDOPTERA OF THE ISLAND OF CAPRI; WITH A FEW NOTES.

BY C. SEYMOUR BROWNE.

(Continued from p. 256.)

It is rather remarkable that the Rhopalocera are not more varied in proportion to the Heterocera, of which I shall be able to mention about 400. One butterfly, which escaped me, and which I could not name, would be all I could at present add further to my previous list.

I am greatly indebted to Sir George F. Hampson, Bart., who has most kindly named a great many of my specimens. I may also mention that Signor Antonino Mazzarella, of Anacapri, can supply most of the Lepidoptera mentioned in my list.

Several boxes of set specimens sent to England, owing to the tender mercies of the post, met with disastrous results; and, as I have been unable to resend several duplicates (papered next time), the list will be short of a few names, which I will add as opportunity occurs.

It has been noticeable that during the driest part of the summer few Lepidoptera have been about, and the darkest nights have not been nearly so productive as the few dark hours before the rise of the moon when about full.

LYCÆNIDÆ (omitted from last list).

580. *Lampides telicanus*, Lang. Common in autumn.

SPHINGIDÆ.

717. *Acherontia atropos*, Linn. Common on the mainland, but only two specimens taken, autumn, 1903. One of these moths flew on board a ship I was travelling in, off Livorno, about six miles from land, end of November, 1901.

735. *Protoparce convolvuli*, Linn. Common.

752a. *Deilephila lineata*, Esp., var. *livornica*, Esp. One specimen, 1902; two, summer, 1903.

759. *Charocampa elpenor*, Linn. Scarce.

368. *Macroglossa stellatarum*, Linn. Very common. N.B.—There should be many more Sphingidæ found here, but I have been too much occupied in the early evenings to give them much attention. I hear of many varieties taken on the mainland.

NOTODONTIDÆ.

781a. *Cerura bifida*, Hb., var. *urocera*, Bois. Rare.

785. *Dicranura vinula*, Linn. Scarce.

858. *Phalera bucephala*, Linn. (see previous note, ante, p. 255).

LYMANTRIIDÆ.

929. *Lymantria dispar*, Linn. Very common.

LASIOCAMPIDÆ.

956. *Malacosoma neustria*, Linn. Common.
 970f. *Lasiocampa quercus*, Linn., var. *spartii*, Hb. Rare.
 1000. *Odonestis pruni*, Linn. Scarce.

SATURNIIDÆ.

1084. *Saturnia pyri*, Schiff. Very common in May. Others of same family should be found here, but have not noticed any.

NOCTUIDÆ.

1152. *Agrotis pronuba*, Linn. Very common.
 1153. *A. orbona*, Hufn. Rare.
 1154. *A. comes*, Hb. Scarce.
 1345. *A. puta*, Hb. Very common, and is one of the first moths to appear.
 1387. *A. obelisca*, Hb. Fairly common in autumn.
 1400. *A. segetum*, Schiff. Very common. The markings vary.
 1402a. *A. saucia*, Hb., ab. *margaritosa*, Hw. Common.
 1425. *Pachnobia faceta*, Tr. Four specimens, spring, 1903.
 1484. *Mamestra glauca*, Hb. Scarce.
 1514. *M. serena*, Fabr. Fairly common.
 1544. *Dianthæcia magnolii*, Bois. Scarce.
 1599. *Bryophila muralis*, Forst. Common.
 1599b. *B. muralis*, Forst., var. *par*, Hb. Commoner than *B. muralis*.
 1664. *Hadena solieri*, Bois. Very common this autumn; a nuisance when working with an acetylene lamp.
 1715. *H. secalis*. Scarce. Specimens taken in the spring.
 1846. *Callopietria purpureofasciata*, Piller. Only one specimen, summer, 1902.
 1848. *C. latreillei*, Dup. Two specimens, summer, 1903.
 1867. *Brotolomia meticulosa*, Linn. One specimen, October, 1903 (see note in previous list).
 1913. *Tapinostola musculosa*, Hb. Fairly scarce.
 1942. *Leucania scirpi*, Dup. Very common.
 1946. *L. punctosa*, Tr. Very common.
 1954. *L. l-album*, Linn. Common.
 1957. *L. loreyi*, Dup. Scarce.
 1961. *L. vitellina*, Hb. Fairly scarce.
 1990. *Caradrina exigua*, Hb. Occurs all through the season, but common in spring.
 2005. *C. selini*, Bois. Scarce.
 2019. *C. ambigua*. Common, autumn.
 2183. *Xylomyges conspicillaris*, Linn. Several specimens last spring.
 2325. *Heliothis peltigera*, Schiff.
 2327. *H. armigera*, Hb. Both fairly common, *armigera* occurring later than *peltigera*. Both show distinct shadings from red-brown to greenish.
 2361. *Xanthodes malvæ*, Esp. Only one specimen, 1902.
 2380. *Acontia luctuosa*, Esp. Very common.

2429. *Thalpochares parva*, Hb., and
 2449. *T. scitula*, Rbr. Both fairly common.
 2490. *Emmelia trabealis*, Sc. Common, spring and early summer.
 2496. *Metoponia vespertalis*, Hb. Fairly scarce.
 2557. *Plusia chalcytes*, Esp. Fairly scarce.
 2562. *P. gamma*, Linn. Very common.
 2571. *P. ni*, Tr. Nearly as common as *gamma*.
 2644. *Grammodes algira*. Difficult to get perfect specimens.
 2670. *Catocala elocata*, Esp. A few specimens.
 2720. *Apopestes spectrum*, Esp. If the broom is searched many pupæ can generally be found in early summer, together with *L. quercus* var. *spartii*.
 2723. *A. dilucida*, Hb. Fairly scarce.
 2743. *Toxocampa craccæ*, Fabr. Fairly common.
 2797. *Herminia crinalis*, Tr.
 2818. *Hypena obsitalis*, Hb. Quantities can be taken in any dark place used for storing brushwood, but have not taken any at light.
 2820. *H. lividalis*, Hb. Occasionally found on walls, and comes to light at night.

(To be continued.)

CURRENT NOTES.—No. 2.

By G. W. KIRKALDY.

(Continued from p. 264.)

To W. F. FISKE (2) we are indebted for an extensive study of the hymenopterous parasites of *Clisiocampa americana*. Primary parasites, hyperparasites of the primary ones, secondary parasites, and hyperparasites of the secondary ones, are all discussed at length. "In the beginning of the series of collections and breedings it was supposed that the parasites would be found to exert considerable influence on the prevailing numbers of their host; that is to say, in the case of *Clisiocampa americana*, for instance, that the parasites would be found to be one of the more important of the factors which governed the abundance of this species from year to year. But investigation failed to confirm this theory. . . . In 1896 it was exceedingly common, . . . and it was consequently assumed that its parasites would also have increased to such an extent as to be a considerable factor in bringing about a more normal condition in 1897. But, strangely enough, this reasoning was found to be diametrically opposite to the facts of the case. In 1896 a great many caterpillars were destroyed by *Limneria fugitiva*, and numbers of the characteristic cocoons of this species were collected and bred. . . . These proved to be in their turn almost entirely the prey of *Pimpla inquisitor*, and the breeding-cages in which the cocoons were confined be-

coming filled with the adults of the hyperparasite, it was given credit for the destruction of large numbers of tent-caterpillars. Thus it was the *Limneria* which proved to be the real victim, and, as its cocoons were rare, the next year the primary host, *Clisiocampa americana*, was indirectly but decidedly the gainer. . . . The parasites, as a body, were found to exact a certain tithe of blood, so to speak, and, this being obtained, would proceed to fight over its possession, passing it from one to another, from parasite to hyperparasite, until often, perhaps, there would be little more than enough left of a single large caterpillar than that sufficient to support a single small chalcid." The annual percentage of caterpillars of *Clisiocampa* destroyed by parasites, Fiske estimates at about 15 to 20 per cent. *Pimpla inquisitor* (Say) and *P. conquisitor* (Say) seem to have the peculiar faculty of being both primary and secondary parasite of the same host. "Though it is doubtful if in nature the following sequence ever takes place, there is no reason why it should not, as all the species mentioned are normally parasitic on the next preceding :—

Host	<i>Clisiocampa americana</i> .
Primary parasite	<i>Limneria fugitiva</i> .
Secondary parasite	<i>Pimpla conquisitor</i> .
Tertiary parasite	<i>Theronia fulvescens</i> .
Quaternary parasite	<i>Dibrachys boucheanus</i> .
Quinquenary parasite	<i>Asecodes albitarsis</i> ."

O. W. BARRETT (3) discusses the Antillean Mole Cricket. The habits of this destructive orthopteron appear to be similar to those of the European *G. gryllotalpa*. The damage to crops in Puerto Rico by the Changa amounts to probably more than £20,000 sterling annually, the crops injured most being cane, tobacco, and rice; comparatively little damage is done in clayey soil, moist sandy loam being preferred, while saturation and extreme dryness of the soil prevent the mole cricket's operations. Remedies are discussed, with notes on the few natural enemies.

H. SCHOUTEDEN (4) continues his interesting contributions to our knowledge of Aphidæ. The present one is to a certain extent a compilation, but is nevertheless valuable, consisting of a list of various plants, with the name of their aphidoceids under each. A second list follows of genera and species of Aphidæ, with the plants (under each) on which they produce the galls. Several new forms are described.

(To be continued.)

NOTES AND OBSERVATIONS.

LOPHOPTERYX CARMELITA.—Whilst collecting about the middle of August in West Kent, I found a larva of *L. carmelita* crawling up a large beech tree. I thought it might have wandered from a neighbouring birch, but on offering it that food and beech it selected the latter. I had no opportunity of visiting the locality again, but my friends Messrs. Cope and Blest went there and took ten more larvæ between August 18th and 27th, all in similar positions, *viz.* crawling up the trunks of beech-trees. Boisterous winds were prevalent at the time, and the larvæ had undoubtedly been blown off the trees. The last one spun up on Sept. 11th. I was previously unaware that the larvæ of *L. carmelita* fed on beech, or that they were to be found so late as the end of August and beginning of September; and I have never known this insect to be double-brooded.—EDWIN GOODWIN; Canon Court, Wateringbury.

THE HYBERNATION OF *DASYCHIRA FASCELINA*.—While on a visit to Rannoch in the summer of 1901, I found on July 15th three larvæ of *D. fascelina* about three-quarters of an inch in length. Two of the larvæ were in slight silken cocoons between stones, one amongst some which formed a small cairn. The other, also in a hybernaculum, was concealed in a thick tuft of heather. The larvæ, on removal, did not eat any food. When disturbed they would curl up and remain without moving for hours, and would then spin a fresh house. On Aug. 1st they had eaten large holes in the muslin covering of their box, using the scraps to spin into their cocoons. Two larvæ died in November, the third survived till the following March, sleeved out in the garden. This year, early in July, on the same hillside, I obtained another larva of *D. fascelina* of the same size and spun up like the three former ones, and which, in spite of being kept in a hot room and supplied with fresh food, has hybernated without eating or moving up to the present date—October 4th. Cases of larvæ hybernating over two winters in captivity are not uncommon, but I have not seen a record in the case of wild larvæ. The causes of hybernation are very obscure, and for the invertebrates have been insufficiently studied. But if we accept the usual explanation, *i.e.* unfavourable conditions, especially cold and hunger, then some instances are easily explicable. Larvæ indoors are of necessity in an unnatural environment, and something in the conditions in which they are being kept may easily induce them to extend their period of hybernation. In 1901, however, everything was apparently favourable; the weather was particularly hot, and food abundant. Thinking that some parasite might have been the cause—though this usually acts as a stimulant—I carefully examined the bodies of the dead larvæ, but found no trace of any. The explanation must be sought elsewhere. It is possible that a cold week at the time when the larvæ usually begin feeding may have induced this curious lengthening of torpidity. It certainly may well have been the cause this season, for a colder and more inhospitable spring has not been experienced in the district for many years.—E. A. COCKAYNE; Sheffield.

SOME ABERRATIONS OF BUTTERFLIES.—Among various aberrations of butterflies sent for examination by Mr. E. Sabine of Erith, the fol-

lowing seem to be of interest:—A female specimen of *Pieris napi*, bred in the spring of the present year. The example is of full size, but on the under side of the hind wings there is a curious partial absence of dark shading to the venation; this only extends along the nervures, and about half-way along the first median nervule, is rather faint. Of *Euchloë cardamines* there is a female specimen with two longitudinal irregular streaks on the under side of the hind wings, extending from just inside the cell almost to the outer margin of the wing. This was taken at Darenth last May, and on the day it was captured only one other female and two males of this species were seen. Two specimens of *Vanessa urticae* reared from larvæ have unusually vivid blue outer marginal spots; these spots are larger than normal, and somewhat wedge-shaped. Several more or less aberrant specimens of *Chrysophanus phleas* were bred in July this year. One is of a pale golden colour; two others are dark copper, tinged with purple on the basal half; one of the latter has rather large blue spots before the band on the hind wings; a fourth specimen has abnormally long tails. The best variety, however, of *phleas* is a female example in which spots 1, 2, 3, and 5 of the submarginal series are extended inwards, forming conspicuous black bars; 2 and 3 unite with the outer discal spot. This aberration agrees very closely with an example figured in Entom. xxix. 191. An interesting point in connection with these aberrations of *C. phleas* is that the females from which the ova were obtained are described by Mr. Sabine as “exceedingly commonplace.”

CENONYMPHA IPHIS IN BRITTANY: A CORRECTION.—We have seen the specimens recorded from Brittany by Mr. Denis Turner as *Cenonympha iphis* (*ante*, p. 246), and find that they are not examples of that species but of *C. arcania*. The error in identification is to be regretted, and with such an insect as *C. arcania* should not have occurred.

ABERRATION OF ARCTIA CAIA.—Mr. F. Hind, of Nottingham, found an unusually pretty aberration of *A. caia*, resting under a hedge in August last. The specimen is normal in every respect, except that the ordinary cream-coloured markings of the fore wings are bright yellowish buff, similar in tint to the hind wings of *A. villica*, but perhaps hardly so yellow.

VAGARIES OF THE SEASON.—I can add some further information to the interesting note on this subject (*ante*, p. 267), for on Monday, Sept. 21st, I found a full-grown larva of *Arctia caia* feeding on groundsel, which spun up in three days. *Epinephele ianira* was still flying here—more than one, on Friday, Oct. 9th.—HUGO HARPUR CREWE; Stanleys, near Brockenhurst.

ABRAXAS GROSSULARIATA: SECOND BROOD.—In the October number of the ‘Entomologist’ I recorded the fact of a larva of this moth spinning up for pupation on Sept. 21st (*ante*, p. 266). I am glad to record that it pupated, and that the moth emerged some time during the night on Oct. 13th. The pupa remained for two weeks outdoors, and for the other six days was kept in a warm room. The perfect insect is a small one, as I expected from the size of the pupa, but is a pretty specimen, having the third series of usually sub-confluent spots on the fore wings almost forming an intensely black transverse band.

The hind wings are light, but not unusually spotted. Since taking the larva that produced this specimen, in the garden, I have found about two dozen pupæ, and quite two dozen larvæ, now nearly all pupated, hanging on various plants and on the fences particularly, south side. I have been daily expecting some of the moths to emerge, but they have not done so yet, though kept in a warm room. *A. grossulariata* has had a remarkable life this year, as the mildness of the fore part of the spring brought on some of the larvæ very early, and consequently there was a partial early emergence in June; then the wet and cold set in and kept the rest emerging until very late. No doubt the pupæ and full-fed larvæ now to be had are the progeny of the early imagines. I took the last pupa, outdoors, on Oct. 22nd. It is worth noticing that this second brood have fed on unusual plants and trees, as the currant and gooseberry bushes were, in my absence, almost stripped of their foliage by the sawfly (*Nematous ribesii*). I have taken the larvæ off plum-trees, apple, raspberry canes and strawberry, though the greatest number were feeding or spun up on young shoots of old black currant-bushes, which I had to cut down owing to another great pest of this neighbourhood—the black currant mite or gall-fly.—ED. G. J. SPARKE; Tooting Bee Road, S.W., Oct. 23rd, 1903.

[In a note dated Oct. 28th, Mr. Sparke writes: "Another *A. grossulariata* emerged this afternoon about 3 o'clock."—ED.]

YELLOW COLOURING OF COCOON OF *PLUSIA MONETA*.—In reply to Mr. Bird's note (*ante*, p. 242), I may state that I have tried the effect of moisture on the cocoons of *P. moneta*, and with various results. In two cases submersion had no apparent effect on the cocoons, while in other cases the cocoons changed to yellow of various shades. Nearly all these experiments were carried out with empty cocoons; the two which did not change colour, however, were white, and comparatively fresh, but moths did not emerge from them owing to the specimens dying after the pupæ had been formed, but whether before or after submersion I cannot say. Mr. F. M. B. Carr, of Salisbury, informs me that he reared four larvæ of *P. moneta* (from Northwood, Middlesex), one cocoon of which is pure white, two dirty white, and one almost entirely yellow. All these four larvæ were kept in a glass-bottom box about two inches in diameter and one and a-half inches deep, and the cocoons were all spun on the side or top of the box. I shall feel obliged if Mr. Bird will let us know how one of these cocoons obtained more moisture than the others. Mr. E. M. Holmes, of Sevenoaks, wrote me last August concerning *P. moneta* as follows:—"All my cocoons this year were exceptionally pale, but five that spun up the first week in June were absolutely white" (these, I understand, changed colour after submersion in water). This fact would seem strange if the presence of moisture caused the cocoons to change to yellow without actual submersion, for we certainly have not had a dry spring this year. Mrs. Holmes has obtained (by submersion) a change in the colour of three-year-old cocoons.—RALEIGH S. SMALLMAN; Carlton House, Herne Hill, S.E., Oct. 9th, 1903.

VESPIDÆ.—I am making a study of the above, and especially of *V. crabro* (the hornet), but have experienced a great difficulty in getting specimens of the species. Can any of your readers help me

by giving localities where they can be found? To be of use to me in dissecting they must be freshly caught or alive.—HERBERT H. CLARKE; Watlington House, Sidcup, Kent, Oct. 6th, 1903.

GEOMETRA VERNARIA.—I read Mr. Russell's article (*ante*, p. 227) with great interest; I obtained a quantity of these larvæ in the spring by beating. One thing I noticed, which may only have been chance: all the males spun up and emerged at least ten days before any of the females. I should like to know if Mr. Russell had the same experience.—HERBERT H. CLARKE; Sidcup, Kent.

EUPITHECIA TOGATA.—The strong winds which prevailed in Scotland towards the end of August had the effect of making the larva of this insect an easy capture. When in Argyleshire, in a locality where a single imago was taken four years ago, I found the ground strewn with spruce cones, many of which contained larvæ. Nearly every cone, however, had been more or less completely eaten by squirrels in the two days which had elapsed since the gale had brought them down, and I should fancy that a large proportion of larvæ must have been destroyed.—JOHN A. NIX; Oct. 5th, 1903.

SIREX JUVENCUS AT WEYBRIDGE.—This beautiful species has been emerging in some numbers during the past month from a fir-tree which was felled and split up at Weybridge, Surrey. As notices are often published of the occurrence of *S. gigas* in different parts of the country, and I have seen it stated that *juvencus* is the more abundant of the two, I should like to mention that in my experience *S. gigas* is by far the more common in Britain. Every year I hear of many of the latter appearing in different places, but not so with *juvencus*, having only occasionally received specimens or notices of its occurrence.—F. W. FROHAWK.

CAPTURES AND FIELD REPORTS.

VANESSA ANTIOPA IN THE ISLE OF WIGHT.—In the 'Field,' Sept. 26th, W. T. records having seen, on Sept. 17th, a specimen of *V. antiopa* fly past him quite close, but not having a net was unable to capture it. Before he saw it, a friend of his had watched the butterfly for several minutes, and as it pitched several times close to him, he was able to identify it without difficulty.—F. W. F.

SPECIES OF THE GENUS PLUSIA IN KENT. — Apropos of the notes on the scarceness of *P. chrysis* I may say that at Sidcup, during last July, I could have taken without any great trouble a dozen or two a night, flying over bramble and other flowers; I procured ova from one of them, the larvæ appeared in due time, and a good proportion fed right up, and the perfect insects are now emerging. I took *P. pulchrina* at the same time, and from the ova obtained one hundred and forty larvæ, but from some unexplained reason they all died when about half an inch long. *P. gamma* at the present time is flying in great numbers.—HERBERT H. CLARKE; Sidcup, Kent.

LEUCANIA LOREYI IN SOUTH DEVON.—A specimen of this excessively rare British moth was captured by me at Torquay (at sugar) on Sept. 27th, 1900.—ALFRED E. HOLDAWAY, Lonouli, Newton Abbot, Oct. 26th.

CHRYSOPE ASPERSA AND **C. FLAVA** AT BALHAM.—On June 21st last I took two specimens of *Chrysopa* off a fence at Balham. These, on examination, proved to be *C. aspersa* and *C. flava*. From their condition at the time I should say that the insects had just emerged.—W. J. LUCAS; 28, Knights Park, Kingston-on-Thames.

SPHINX CONVULVULI IN IRELAND.—While dusking on the evening of Sept. 6th last, in Ireland, I took two specimens of *S. convulvuli* at flowers of *Nicotiana affinis*. They are unfortunately both very worn.—F. W. Y. JACKSON; 2, Vicarage Gate, Kensington, W., Oct. 11th, 1903.

SPHINX CONVULVULI AND **CHÆROCAMPA NERII** IN WARWICKSHIRE.—I had brought me yesterday a lovely male specimen of *C. nerii*. It was found at rest on a yew cut hedge in a gentleman's garden on the outskirts of the town. Evidently it had just emerged, and is in perfect condition. This does not agree with Newman's theory that one now and again is blown over from France; it could hardly have got to the middle of Warwickshire by that method. A fortnight ago I had a male *S. convulvuli* brought me, found at rest on a door in a close yard in the middle of the town.—CHAS. BAKER; 25, Long Street, Atherstone, Oct. 10th, 1903.

CHÆROCAMPA CELERIO AT BRIGHTON.—I have just received a specimen of *C. celerio* from Mr. F. Trangmar, of Brighton. It was captured on October 24th last at the Brighton railway works by Mr. J. Clayton, who caught it with his hands, and consequently the specimen is slightly rubbed.—H. McARTHUR; 35, Averill Street, Fulham Palace Road, W., October 26th, 1903.

PHIBALAPTERYX FLUVIATA (GEMMATA) AT CHICHESTER.—Seeing but few notices of this pretty little geometer, and as it is the first time that I have ever seen or taken it alive, it may be interesting to record the capture of a female specimen at a gas-lamp here on Sept. 22nd last.—JOSEPH ANDERSON.

NOTES ON LEPIDOPTERA AT CHICHESTER, 1903.—In common with very many collectors of Lepidoptera, my experience has been that of a succession of bad seasons, this has been absolutely the worst which I ever remember. I began sugaring early in June, and on the 8th of that month took *Dipterygia scabriuscula* for the first time in this locality. On July 18th *Mania maura* first made its appearance, and at the end of the month *Apamea unanimitis* and *Hadena didyma*, the latter varying greatly. I also took *Miana literosa*. *Zeuzera pyrina (asculi)* occurred in August. In September *Agrotis suffusa* and *Xanthia gilvago* came to sugar.—JOSEPH ANDERSON.

LUCANUS CERVUS AT CHICHESTER.—This fine beetle has been somewhat abundant here this season.—JOSEPH ANDERSON.

ACRONYCTA ALNI IN HAMPSHIRE.—On August 12th last a larva of this scarce moth was found and brought to me by the daughter of one of my gardeners, who noticed it on a hazel bush not far from this house. Unfortunately it proved to be "ichneumonoid," and died

in a few days. — HUGO HARPUR CREWE; Stanleys, Brockenhurst, Hants.

PIERIS DAPLIDICE, &c., AT FOLKESTONE.—On July 6th of this year, while collecting *Lycæna bellargus* at Folkestone, I took a female specimen of *P. daplidice*. One hind wing is slightly chipped, but otherwise it is in very fair condition. I found *L. bellargus* fully out, and *L. minima* was abundant. I think it is unusual for *minima* to be out at the same time as the first brood of *bellargus*, and July 6th is a late date for the latter species.—F. KINGSMAN; 47, Parkstone Road, Peckham, S.E.

LEUCANIA VITELLINA, &c., AT LEWES.—During a recent short visit to Lewes I captured a specimen of *L. vitellina* at sugar (Sept. 27th). It is not in very good condition, being somewhat rubbed. *Noctua xanthographa* was very common in the same locality, and I also noticed *Noctua c-nigrum* and *Anchocelis lunosa*. On the 26th I sugared at another spot about a mile from where I took the *L. vitellina*, and took several *Agrotis suffusa* and *A. segetum*. *Anchocelis pistacina* was also seen, and numbers of *Phlogophora meticulosa*. On one patch I counted sixteen of the latter, besides other species. In the course of a long walk on the 27th I noticed a good many *Vanessa cardui* and *Plusia gamma*, and netted a series of *Stenopteryx noctuella* (*hybridalis*), and at dusk *Crambus inquinatellus* was taken. The total bag for one day and two evenings was about forty specimens.—PHILIP J. BARRAUD; Bushey Heath, Herts.

PYRAMEIS ATALANTA AT LIGHT.—I have to record the capture of a *Pyrameis atalanta* while flying round an acetelene gas-lamp at about ten o'clock last night in Wallington. I have never heard of this species being taken in this way before, though I have noticed two or three specimens of *Pyrameis cardui* inside the lamps during the last two months. Both species have been exceedingly abundant here this year, especially the first-named, and it was not at all an uncommon thing to see from four to seven of this beautiful butterfly settling on an old sugar patch in the morning.—LESLIE H. MORSE-ROBINSON; Wandle Bank, Wallington, Surrey, Oct. 20th, 1903.

PYRAMEIS CARDUI AT ELECTRIC LIGHT.—At the Clapham electric lights two specimens of *P. cardui* were taken on September 17th at ten o'clock at night, and another specimen on the 18th.—H. G. WEBSTER; 147, Elsley Road, Lavender Hill, S.W., Oct. 8th, 1903.

PYRAMEIS CARDUI, &c., IN KENT.—I have seen this insect in almost every lane and field round here for miles during September, and over one field of mustard they absolutely swarmed; had I been so disposed I could have captured them by hundreds. *Polia flavocincta* also, at the time of writing, literally swarms at sugar. *Mania maura* in July seemed to be very plentiful, flying into the house at dusk.—HERBERT H. CLARKE; Sidecup, Kent, Oct. 8th, 1903.

PYRAMEIS CARDUI AND PLUSIA GAMMA.—The following note may be of interest with regard to the appearances of these two insects. I went to Great Yarmouth, Norfolk, on Sept. 9th, and stayed there until the 21st of that month. Up to Thursday the 17th the weather was very stormy, the wind being very high and blowing chiefly from the

north-west, but it moderated on the 17th, and in the evening of that day, at dusk, I saw the first *Plusia gamma*, flying over bramble blossom at Great Ormesby. The next day, Friday the 18th, when the wind changed nearly due east and remained in this quarter until I returned, and was very stormy, I noticed several *P. gamma* flying around the flower-beds in the gardens on the sea-front at Yarmouth, and one *Pyrameis cardui*, which appeared a little worn. On Saturday the 19th, there were several *P. gamma* on the North Denes, and in the course of the day I saw three *P. cardui* about the town and gardens. The next day, Sunday, I noticed two *P. cardui* flying in one of the gardens near the sea-front as early as half-past six in the morning, and saw six or seven during the day, all more or less worn. Later in the morning I was walking across the North Denes and noticed *Plusia gamma* there in hundreds, although, as previously stated, there were only a few on the day before. There were no *P. cardui*, but several were seen, on my return to the town, flying around and sitting on the flowers in the gardens of the houses. I returned by boat on the 21st, and the wind was blowing half a gale, but between Gorleston and Walton I saw eight *P. cardui* pass over the boat as they flew towards the shore. I did not reach Walton until half-past four, as the boat was delayed two hours owing to a break-down, or I might have been able to have seen others on landing; the last I saw was flying around the pier at Walton. I might add that several *P. cardui* have been taken in Nunhead Cemetery and brought to me, all more or less worn and damaged; and I have seen it at Brockley and in my own garden at Peckham, but I think this is common knowledge, as it has occurred around London pretty generally. In South Square, Gray's Inn, the other morning there was an example of *Pyrameis atalanta* sunning itself on the wall of the buildings.—H. W. BARKER.

SOCIETIES.

SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—*August 27th, 1903.*—Mr. E. Step, F.L.S., President, in the chair.—Mr. R. Adkin exhibited a variety of *Limenitis sibylla* in which the white markings were somewhat reduced in size and partially obscured by a dusting of black scales, together with a var. of *Cleora glabraria* in which the basal third of the fore wings was very dark. Both were from the New Forest.—Mr. Step, the very large Heteropteron, *Belostoma grande*, from Trinidad, where it is known as the "Electric Eel."—Mr. West, the three British representatives of the Heteropterous genus *Pilophorus*, all from Oxshott, viz., *P. cinnamopterus* on pines, *P. perplexus* and *P. clavatus* on oak.—Mr. Hare, a variety of *Acidalia aversata* with the posterior half of both fore and hind wings suffused with fuscous.—Mr. Dodds, several curiously streaked male specimens of *Ocnieria dispar*. He had inbred the species for the last three seasons, and had not previously met with this variation. The streaks were the colour of the female, and very far from being symmetrical.—Mr. Garrett, a male specimen of *Porthesia similis* (*auriflua*) only half the usual size, taken at Wimbledon, and a female

Polyommatus corydon with several blue marks along the costa of the right fore wing, forming a broken streak. It was taken at Purley.—Mr. West and Mr. Ashby reported that they had been warned out of the open sandpit on Oxshott Heath, while searching for Coleoptera, because “it interfered with the birds getting their evening meal.”—Mr. F. M. B. Carr, (1), a collection of Lepidoptera made this season in the Salisbury district, including *Eugonia polychloros*, *Nemeobius lucina*, *Lithosia sororcula* (*aureola*), *Gastropacha quercifolia*, *Notodonta dictæa*, *Plusia moneta*, *Eurymene dolabraria*, *Cleora lichenaria*, *Minoa euphorbiata*, &c.; (2), a bred example of *Cabera pusaria* var. *rotundaria*; and (3), a series of *P. moneta* bred from Northwood larvæ, together with yellow and white cocoons. He said that white cocoons dipped in water became yellow. He also noted that some sixty males of *Orgyia antiqua* had assembled to a bred female in two days.

September 10th.—The President in the chair.—Mr. Garrett exhibited a specimen of *Pyrameis atalanta*, with the red submarginal band of the hind wings marked with yellow spots. It was bred from Arundel larvæ.—Mr. Goulton, a larva of *Coleophora limosipennella*, found feeding on birch at Oxshott, and also photographs of various larvæ, including *Cucullia verbasci*, *C. lychnitis*, *Jocheera* (*Acronycta*) *alni*, *Pterostoma palpina*, &c.—Mr. Adkin, a series of *Zonosoma linearia*, reared from West Sussex ova. He referred to the varieties exhibited, and pointed out a specimen in which occurred a small wedge-shaped dark mark extending inwards from the central line of the fore wings.—Mr. Main, examples of three species of New Zealand butterflies, including *Pyrameis gonerilla*, the close ally of our *P. atalanta*.—Mr. Carr, larvæ of *Melanthia albicillata* and *Cosmotriche potatoaria*, and stated that he had a larva of the latter species which apparently intended to go over a second winter. A discussion ensued.—Mr. West (Greenwich), a series of the Homopteron *Gargara genistæ*, which he had taken on broom at Oxshott. At first the males were in great preponderance, but later on the females were much the more numerous.—Mr. Clark, photographs of the ova of *Gastropacha quercifolia*.—Mr. Carpenter recorded the fact of the pairing in captivity of bred *Pararge egeria* by Mr. Joy. They were enclosed in a band-box covered with leno and exposed to the full sun.

September 24th.—The President in the chair.—Mr. South exhibited (1), a short series of *Aplecta nebulosa*, bred from Delamere Forest larvæ, received from Mr. Thompson; all were darker than the typical form, but only two were var. *robsoni*; (2), a series of *Cabera pusaria*, reared from larvæ obtained from Oxshott, Wisley, and Epping; most of the specimens resembled var. *rotundaria* in marking, but only a few of them agreed with that form in the shape of the wings.—Mr. Goulton, bred series of *Orgyia antiqua* and *Emmelesia unifasciata*.—Mr. F. B. Carr, (1), a bred series of *Malacosoma neustria*, from New Forest ova; all were brown in colour, half the males pale and half the same shade as the females; (2), a larva of *Cleora glabraria*, taken in the New Forest at Easter, and still feeding.—Mr. Boxer, a collection of butterflies and moths from Durban.—Mr. West (Greenwich), short series of three species of Hemiptera taken from broom at Oxshott in September—*Livilla ulicis*, *Dictyonota strichnocera*, and the rare *D. fuliginosa*.—Mr. Lucas read the report of the Horsley Field

Meeting held on June 6th, and illustrated his remarks with lantern slides.—HY. J. TURNER, *Hon. Rep. Sec.*

RECENT LITERATURE.

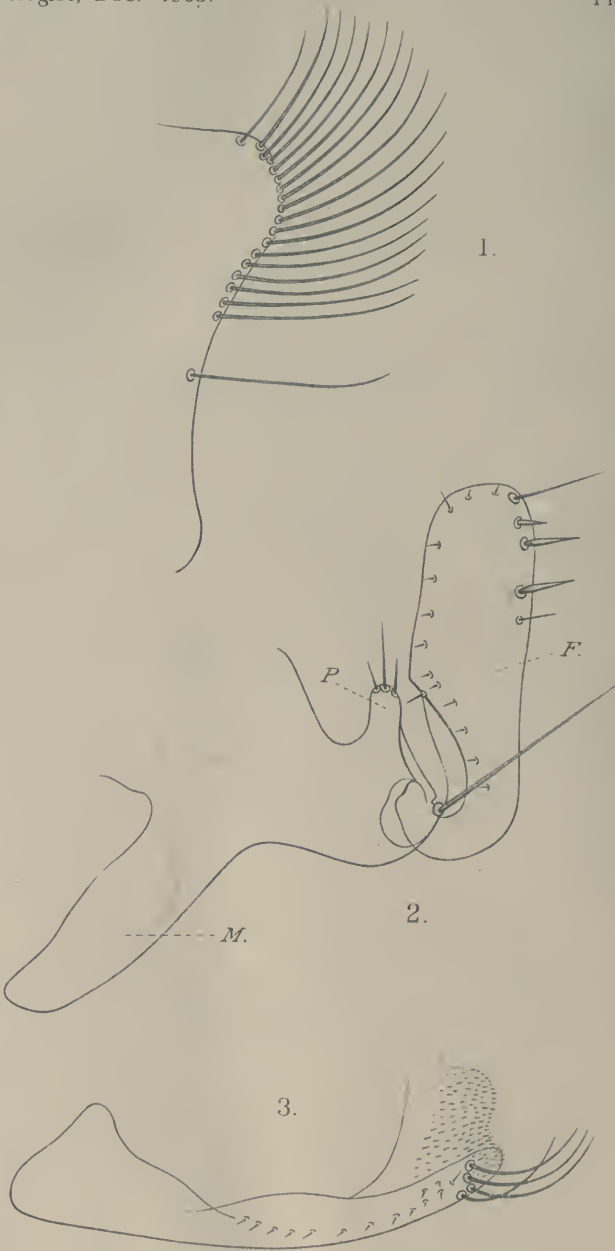
A Catalogue of the Coccidæ of the World. By Mrs. MARIA E. FERNALD, A.M. 8vo, pp. 360. Amherst, Mass.: Carpenter & Morehouse. 1903. (Hatch Experiment Station of the Massachusetts Agricultural College; Bulletin No. 88.)

Until comparatively recent years there were few students of this important family of homopterous insects, and there has been no general monograph of the Coccidæ since Signoret's series of papers on the family were concluded in the 'Annals' of the Entomological Society of France, about thirty years ago. During the last ten years or so considerable attention has been given to Coccids. Professor Cockerell, among others, has added very extensively to our knowledge of the family, and has done much valuable work in clearing up many of the intricate points in synonymy. A few books on the subject have been produced, and of these we may mention Green's 'Coccidæ of Ceylon' (i., 1896, ii., 1899), and Newstead's 'Monograph of the British Coccidæ,' vol. i. of which was published by the Ray Society in 1901. Altogether a vast amount of literary matter has accumulated, and awaits the monographist. In the meanwhile the excellent Catalogue before us should prove a veritable boon to everyone in any way interested in Coccid literature. Upwards of fifteen hundred species are enumerated, the references are most comprehensive, and, we should suppose, would enable one to get in touch with almost everything that has been written on the subject from the year 1758 down to the end of February, 1903.

Mrs. Fernald has carried out a laborious and somewhat difficult undertaking in an exceedingly able manner.

OBITUARY: CLAUDE A. PYETT.

The death is announced of a promising young entomologist, Mr. CLAUDE A. PYETT, of Ipswich, whose name will be familiar to readers of the 'Entomologist' as the contributor of Notes on the Lepidoptera of South-west Suffolk. Mr. Pyett, who was of colonial extraction, chose the profession of a journalist, and in the brief intervals of leisure which that somewhat exacting career affords devoted his attention to scientific and artistic pursuits. He possessed the rare gift of taking careful and accurate notes of his observations, and was always ready to place his knowledge of the insect-fauna of the Ipswich district at the disposal of his fellow-workers. Mr. Pyett was no mean artist, and many sketches from his pen have appeared as illustrations to his articles and reports in the press of the Eastern Counties. It is to be feared that he overtaxed a somewhat fragile frame during the Newmarket election campaign of last year. An attack of typhoid fever left him in a very weak condition, and he passed away at his home at Ipswich on October 2nd, the actual cause of death being syncope.



West, Newman lith

Ceratophyllus dalei Roths

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[No. 487.]

A NEW BRITISH FLEA, *CERATOPHYLLUS DALEI*, SP. NOV.

By THE HON. N. CHARLES ROTHSCHILD, M.A., F.L.S.

PLATE V.

IN our article, "Types of Siphonaptera in the Daleian Collection,"* we pointed out that Mr. C. W. Dale possessed a single male specimen of a flea taken from the nest of a wood-pigeon (*Columba palumbus*) which, in our opinion, represented a very distinct new species.

Mr. Dale, however, considers the insect in question to be identical with *Ceratophyllus columbæ* (Walcken. & Gerv.)† We do not agree with Mr. Dale, and take this opportunity of describing the species and naming it in his honour.

This insect is allied to *C. gallinæ* and *C. fringillæ*. It is, however, much paler in colour even than the latter-named species. The more strongly chitinised portions of the exoskeleton and those parts which cover each other are more or less pale yellow in colour in the mounted specimen. The abdominal tergites are brownish above, the prothoracic comb being deep brown. The head is very similar to that of *C. fringillæ*, being somewhat longer in proportion and a little more evenly rounded. The pronotal comb consists of twenty-seven teeth. The epimerum of the metathorax bears six fine hairs, one at the apex, three arranged in a row from the stigma downwards, and two more near the base. The legs are markedly different from those of *C. fringillæ*, the spines on the back of the tibiæ and fifth tarsal segments being much stouter.

The eighth tergite (fig. 1) of the abdomen is modified in a special way. Its distal edge is almost vertical, being slightly sinuate. The tergite, moreover, is produced upwards, and is

* Ent. Mo. Mag. (Ser. 2), vol. xiv. p. 146 (1903).

† Walcken. & Gerv. Hist. Nat. Ins., Aptères iii. p. 375 (1844).

strongly rounded. The long bristles at the edge of the segment are very numerous, some nineteen being situated close together, the most ventral hair only being separated from the next by a larger interspace. The eighth sternite (fig. 3) bears, close to the apex, three long bristles on each side, besides one ventral bristle which stands close to the others, and which is a little shorter and thinner than the rest. On the lateral surface of the eighth sternite there is a row of extremely small hairs, the hair nearest the apical bristles being the longest. The sternite ends apically in a large hairy membranous flap. This flap is very different from those found in *C. gallinæ* and *C. fringillæ*, but its exact outline cannot, unfortunately, be made out from the slide. There is only one long bristle near the insertion of the movable finger (fig. 2, F.). The finger (fig. 2, F.) is somewhat similar in shape to that of *C. gallinæ*, it is completely rounded at the apex, and differs conspicuously from the allied species in the size and arrangement of the bristles. There is one bristle at its apex, being about as long as the finger is wide in the middle. Close beneath it there is a short pointed spine followed by a spine-like bristle which is about half the length of the long apical one. A similar bristle is placed further down. Length 2·7 mm.

The type and only known specimen of this new species was taken by Mr. C. W. Dale, at Glanvilles Wootton, Dorsetshire, from the nest of a wood-pigeon, some years since.

PROBABLE ORIGIN OF CORNISH *PLUSIA NI*.

By H. GUARD KNAGGS, M.D., F.L.S.

IN the November number of the 'Entomologist,' p. 277, an editorial note occurs to the effect that "*Plusia brassicæ*, Riley, is rather larger in size and browner in colour than *P. ni*, and that it would be interesting to know to which form the Penzance specimens are referable, as this might afford a clue to their origin."

Let me first call attention to papers in 'The Entomologist's Annual' for 1868, pp. 67-8, and note, p. 96, and for 1869, pp. 68 and 69, and note, p. 82, wherein my old friend the late Frederick Smith, of hymenopterous fame, gives an account of a wasp of the genus *Polistes* which was caught by a lady at Penzance in the summer of 1866, and again in 1867. Three specimens were taken and several others were seen at the same time, and my friend remarked upon the close resemblance to *Polistes biguttatus*—a South American insect—and suggested the possibility of its being an imported species.

Mr. Smith says that his correspondent undertook to make every enquiry as to what vessels had entered the harbour from America. In July last he received the following information:—

"After trying in vain to obtain any intelligence of shrubs or unsawn wood being imported from South America, a remark of my sister's turned my thoughts in another direction. She told me that the common wasp was often very troublesome to butchers by its taste for raw meat. Now there is a regular trade between Penzance and South America in raw hides, and it occurred to me as possible that the South American wasps might have settled on the hides, and so have got wrapped up and entangled in them. It was also ascertained that the ship conveying the hides arrived at Penzance on the 25th of July, 1866, and the *Polistes* was captured about 15th August. In 1867 the same ship entered the port of Penzance on 31st of July, and the *Polistes* was again taken during the first week of August." The captain of the vessel, when interrogated about the wasp, said they "no doubt came from his ship, as he had seen hundreds about it when sailing down one of the branches of the La Plata."

"The explanation," Mr. Smith thought, "fully accounted for the capture of the *Polistes*, and at the same time suggested a way by which many carrion beetles may be conveyed to this country in a way that might not occur to entomologists who pick up such insects in the neighbourhood of Penzance, as well as near ports in other parts of the country." He also mentions that Mr. Douglas captured the same species of *Polistes* at St. Katharine's Docks, and Mr. Nicholas Cooke took another in the office of a wool warehouse at Liverpool.

My own opinion is that *P. ni* (*brassicæ*, Riley) came over with *Polistes*; it is common in Brazil and other parts of South America, and it is this insect which is becoming such a nuisance in the States: the conditions were there for making the voyage. We know that moths and caterpillars do find their way on board vessels, and cocoons may be made up in wool or hair. No captures of *P. ni* were made till *after* the arrival of the vessel with *Polistes*. *P. ni* is a rare continental species, and is almost unknown in the north of Europe. An immigrant from South Europe would be most unlikely to land at the far west. All the specimens here have been taken either at the west or straggling away from it—Cornwall, Devon, Dorset, and Portland, but the metropolis is at Penzance.

Miss Carne's specimen was caught in May, and showed that the species was double-brooded, and had been bred in the country; and Mrs. Richardson's as well as the more recent Penzance experience prove that the species breeds freely enough in this country. So that, if my surmise is correct, this *Plusia* has been an inhabitant of Penzance for nearly forty years.

In fact, I am persuaded that the North American, the British, and in all probability the European *ni* too, only from an earlier period, all hail from "the country where the nuts come from," or thereabouts.

ON A NEW VARIETY OF *PAPILIO MIKADO*, LEECH.

BY A. E. WILEMAN, F.E.S.

*PAPILIO MIKADO* var. *ALBIDUS*, NOV.

Differs from the type in having a creamy white ground colour, and most of the typical black eliminated. On the under side the black is confined almost entirely to the margins of the wings.

This variety of *P. mikado* was found in the province of Higo, island of Kyushu, at the end of May, 1898. It would seem to be very scarce, as only six specimens were taken, although the typical form is not uncommon in the localities where they were captured.

LIFE-HISTORY OF *ARGYNNIS LATHONIA*.

BY F. W. FROHAWK, M.B.O.U., F.E.S.

ALTHOUGH a common continental species, there appears to be no satisfactory description published of the larva or pupa either in this country or abroad, and as regards English authors, they have copied Freyer, Godart, and Sepp. The descriptions given by these three writers all vary, and not one is correct; therefore the following descriptions may perhaps be of general interest, as I have this autumn succeeded in working out all the stages of this butterfly—*A. lathonia*.

Firstly, I must mention that it is through the kindness of Mr. W. G. Sheldon that I have been enabled to do so, as he

kindly sent me the only female specimen he obtained during his visit to Switzerland last summer. This he captured at Zermatt on Aug. 2nd, and at once despatched it to me, arriving on Aug. 6th. When I opened the small box containing it, I found it in a very feeble state, and one leg missing, and I must say I had very slight hope of obtaining eggs from this female, especially as she had but three legs, as I have generally found a difficulty in inducing butterflies to deposit if they have sustained injury to their legs. However, "where there is life there is hope." I immediately set to work to restore her by feeding her with sugar and water, and while she was feasting for about fifteen minutes I potted up a plant of wild heartsease (*Viola tricolor*) for her reception. Upon this I put her as soon as she had finished drinking, and placed it in the sun, when gradually she revived, but owing to the day turning dull no eggs were laid; but the following morning was bright and sunny, so I carefully watched her movements, and saw the first egg laid at 9 a.m., and by 10 a.m. she had produced about three dozen, and during the day about one hundred were deposited; these were laid singly, and mostly on the plant, but many on the gauze covering as well. I fed her again each succeeding morning, but no more eggs were deposited, and she died on the seventh day.

The egg is $\frac{1}{16}$ in. high, of a rather straight-sided conical form, widest at the base, where it is smooth and rounded off at the edge. There are about forty longitudinal keels, irregularly formed and of different lengths, some not reaching half-way up the side, and others running the entire length from base to crown, where they terminate abruptly, and form a series of triangular peaks round the summit surrounding the granulated micropyle; the spaces between the keels are finely ribbed transversely. When first laid it is of a very pale lemon-yellow colour, inclining to ochreous, appearing almost white in certain lights; the colour gradually deepens, becoming yellower with a greenish tinge. On the fifth day the crown of the egg assumes a dull grey, finally changing to a lilac-grey. All the ova hatched on Aug. 14th, remaining in the egg-state seven days.

Directly after emergence the larva measures $\frac{1}{4}$ in. long. The body is cylindrical, and the segmental divisions are deeply defined, each segment swelling in the middle. There are ten longitudinal rows of shining olive-coloured irregularly-shaped warts, five on each side, *i. e.* three above the spiracle and two below; the first dorsal and last lateral ones are bilobed; each of the lobes and the other warts bears a long serrated bristle; the longest and most curved are those on the dorsal surface; all curving forwards, the smallest being the anterior one of the dorsal pair. All these bristles are shining black, with whitish transparent tips. The head is shining black, and beset with similar but shorter bristles; the entire body is densely sprinkled

with very minute black points, adding depth to the pale olive-yellow ground colour; the claspers are of the same colour, and bear a pair of simple white spines; the legs are dusky.

Shortly before first moult it measures $\frac{1}{5}$ in. long, the ground colour is creamy white, the sides and ventral surface are mottled and chequered with pale ochreous brown, the cream colour forming longitudinal dorsal and spiracular stripes; the surface is particularly glossy.

First moult occurred on Aug. 20th.

Before second moult it measures $\frac{1}{5}$ in. long. The shining surface of the body is covered with minute black points; each segment from the fourth to eleventh inclusive has six prominent tubercles, each set with a number of serrated bristles; these form longitudinal rows, the first being subdorsal, the others super and subspiracular; along the lateral edge and base of the claspers is another row of much smaller tubercles; the first segment has eight, the second and third segments have each ten, and the twelfth has four tubercles; all are black and bear bristles; numerous black hairs are scattered over the surface, each having a black shining base; the head, black and shining, is also beset with black bristles; there is a dorsal cluster of similar bristles in the centre of both the first and last segments. The ground colour is a pale lilac-grey, with a fine medio-dorsal stripe and an ochreous spiracular band; the subdorsal surface is chequered with blackish; the legs are shining black.

At the least disturbance they fall from the food-plant and remain rolled up in a ring for about two minutes.

On Aug. 22nd I counted ninety-two larvæ in different stages, but the majority in the second stage.

Second moult on Aug. 24th.

Before third moult it measures $\frac{1}{3}$ in. long, being very similar to the previous stage, except the colouring is more pronounced, and the tubercles are developed into short spines, but bearing bristles as before. They are very active in their movements, running rapidly, and feed voraciously.

Third moult, Aug. 29th.

On Aug. 30th I placed seventy-three larvæ on dog-violet (*Viola canina*), but all refused to eat it, so transferred them to *V. tricolor*, when they immediately commenced feeding.

Before fourth moult it is $\frac{7}{12}$ in. long while extended crawling. The ground colour is chiefly black, with a broken double greyish white medio-dorsal line, and sprinkled all over with minute black hairs, each encircled with whitish at the base; a creamy white lateral line, on which are situated the subspiracular ochreous spines, each having a swollen bulbous deep amber base; the dorsal spines are almost black, having only the tips dull ochreous, and a smaller amount of dull amber colour on the base; the spines on the first three segments are more amber

coloured than the others on the dorsal surface, resembling the super and subspiracular ones on the rest of the segments; all the spines are bristle-bearing; the claspers are ochreous; the legs and ventral surface, as well as the head, are black, but the latter is chequered with amber colour.

A large number of the larvæ moulted the fourth and last time on Sept. 1st. When fully grown it measures $1\frac{1}{4}$ in. while crawling; the body is slightly tapered, mostly so at the anterior end; each segment has two transverse wrinkles on the posterior half, the anterior half is of one plain surface; the six rows of spines are moderately long, stout at the base, and sharply pointed; all bear a number of shining black bristles; the subdorsal series are olive-brown, with ochreous brown bases; the super-spiracular series are paler brown, with amber bases, while those of the subspiracular row are wholly amber-brown, palest at the tips. The ground colour is velvety black, the spiracles are black encircled with whitish, the double medio-dorsal line is composed of two longitudinal white streaks on the anterior part of each segment, these being followed posteriorly by a double row of white warts emitting black bristles; from the base of each dorsal spine is a cream-coloured streak, and two similar streaks from the super-spiracular spines; these run over the anterior portion only of each segment from the spine to the segmental division; the subspiracular spine is situated on a buff and cream band, which, however, is clouded in the centre with dark olive; the ventral surface, like the dorsal, is black and velvety; the entire body is rather densely sprinkled with pure white minute warts, each emitting a black bristle; the legs black; the claspers dull amber-brown; the head amber on the upper half, the remainder being black, and is beset with bristles like the body.

When preparing to pupate the larva spins a considerable quantity of silk over part of the plant selected, and an ample pad of silk to grasp with the anal claspers. After hanging for about thirty hours it pupates.

During the last few days of the larval state they feed most voraciously on the bloom and leaves of both the wild and cultivated pansy, but not on either dog- or sweet-violet. I noticed they appeared to avoid the strong sunshine by sheltering on the under side of the leaves, and often selecting the most shady part of the plant to rest upon; but yet they enjoyed warmth, becoming very active and feeding rapidly on the brightest and warmest days.

The pupa measures from $\frac{2}{3}$ in. to $\frac{3}{4}$ in. in length, the largest producing females. In structure and general formation it most closely resembles the pupa of *A. selene*. Lateral view: head rounded; thorax rounded and swollen, sloping off to the meta-thorax and waist; it then gradually increases in size to the third abdominal segment, from which the abdomen decreases

and curves abruptly at the sixth and seventh segments, terminating in a well-developed cremaster; the abdomen is fairly straight along the ventral surface; near the apex the wing is swollen, and then runs in an almost straight line to the head. Dorsal view: the head is square, the thorax projecting and angular, indented at the waist and swollen across the third abdominal segment, then gradually tapering to a point. Colour: the head, thorax, and wings shining olive-brown; the abdomen chequered and speckled with olive-brown, ochreous, black and white; spiracles large, black, and conspicuous; on the third and fourth segments is a clouded pearly-white blotch, which spreads in the form of a large blotch over the centre of the hind margin of the wing. There are seven longitudinal rows of short, blunt, deep amber-coloured tubercles or points on the abdomen, the subspiracular series being very small; those forming the subdorsal rows are the largest; the medio-dorsal and super-spiracular ones are about equal in size; all these are surrounded at the base by whitish; the subdorsal points on the prothorax, mesothorax, metathorax, and first two abdominal segments are placed on brilliant burnished silver-gilt disks, the largest being on the metathorax; the inner margin wing-ridge is pearly whitish, the head and eye speckled with dull white; the surface is shining and covered with minute granulations, and when viewed under the microscope exactly resembles the skin of a toad, especially the wing-surface. The thoracic dorsal surface and abdomen are sprinkled with minute club-tipped bristles.

The first two butterflies (both females) emerged on Sept. 25th, followed by others on the three following days, but only ten out of ninety pupæ emerged, these being three males and seven females. Eighty of the pupæ died, although these were all fine as regards size, and apparently quite healthy at first. There is no doubt that the late autumn English climate is quite unsuited for the existence of this species, as well as it is for both *Colias edusa* and *C. hyale*, *Pieris daphidice* and *Vanessa antiopa*, apparently none of these being able to establish themselves in this country.

November, 1903.

LEPIDOPTERA REARED FROM OVA OR LARVÆ DURING THE PAST SEASON.

By F. A. OLDAKER, M.A.

BROADLY speaking, the year 1903 has been in my experience a disastrous one for larvæ. Quite eighty per cent. of those which have passed through my hands have died, and I cannot assign as a cause any neglect or want of precaution on my part. Food has been kept fresh, and breeding-cages have been kept clean, but the methods which in former years have succeeded

admirably in most cases have failed lamentably this year. Whole broods—notably about fifty larvæ each of *Pæcilocampa populi*, *Hoporina croceago*, and *Asteroscopus sphinx*—fed up, apparently quite healthily and normally, until after their last change of skin, and then died off one by one, without a single specimen reaching the pupa.

To have been successful to any extent with only eighteen species out of a total of sixty-one, is scarcely a good record for the year, but some of the successes have gone far to make up for the failures. Six young larvæ of *Apatura iris* were sent me from Brockenhurst on May 12th; one died on the journey, and a second refused the sallow I offered it, but the other four fed up rapidly and successfully, and produced imagines—two fair-sized males on June 30th and July 1st, and two fine females on July 4th and 6th. They had pupated respectively on June 8th, 10th, 18th, and 23rd.

I experienced a fair amount of success with the larvæ of *Zephyrus betulæ*, but a good number died during the pupa stage; and I reared several specimens of *Zephyrus quercus* from larvæ beaten on Ranmore, but in this case also a great number died as pupæ, and some too before pupation. The larvæ of *Nemeobius lucina* died off in great numbers after the last moult, and about forty young larvæ of *Lycæna astrarche*, produced from ova deposited in a pill-box during the walk home from Ranmore, died off before their first moult.

Among the Sphinges I had a fair amount of success with *Sphinx ligustri*, *Chærocampa elpenor*, and *Smerinthus ocellatus*, but considerably less than in former years; and one day I found a larva in the bark of an old apple tree, which produced a very fine female *Sesia myopiformis* on July 2nd; I am led to hope that I may find a number of these larvæ in the same tree next year. *Nola cucullatella* is one of my complete failures, but *Euchelia jacobææ* was, if possible, more abundant this year than usual. At Dorking the larvæ had all gone down by the end of July, but at Bognor I noticed a lot still quite small at the beginning of September. I bred some *Arctia caia* in the hope of getting some varieties; but, though no two are exactly alike, there is no striking divergence. *Porthesia similis* I hope I have now bred for the last time, for the inconvenience caused by the urticating hairs was very great. It appears to me that one gets stung much more readily from the cocoon than from the larva. I was very fortunate with *Limantria monacha*, for, although I only got about half-a-dozen through, out of some thirty larvæ, I obtained a light and dark specimen of both male and female, the darkest male being especially fine. My disasters with *Pæcilocampa populi* I have mentioned above, and a brood of *Malacosoma neustria* behaved in a similar manner. Out of fifteen larvæ of *Gastropacha quercifolia*, kindly sent me by Mr. J. H. Carpenter, of Leather-

head, I bred thirteen fine specimens, the females especially being exceptionally large. The other two emerged from the pupæ, but were deformed. Total failures have to be recorded with *Drepana cultraria* and *Pheosia dictæa*, the larvæ in each case dying off when quite small. A number of larvæ of *Mamestra persicariæ* were found at night feeding on geraniums in the garden, and these have gone down to pupate, successfully so far as I know. Fourteen nearly full-fed larvæ of *Triphæna ianthina* were sent me from Galashiels, and everyone of these produced an imago. There is very little variation among them, though two or three are more clearly suffused with red than the others. About a dozen larvæ of *Triphæna fimbria* from Sussex produced a most interesting series of insects. One is the mahogany brown variety, two are very light, one is very dark green, and there are several intermediates, one of which is a beautiful grey-green. *Hoporina croceago*, *Xanthia aurago*, and *Cosmia paleacea* were total failures, as well as a small brood of *Polia chi* from ova laid by a var. *olivacea*. *Calocampa solidaginis* larvæ emerged from ova, but refused to eat, and *Asteroscopus sphinx*, after having caused an infinite amount of trouble in getting apple-buds, before the leaves were ready, and after thriving well right up to the last, suddenly ceased feeding and died. Six pupæ of *Plusia moneta* were sent me from the neighbourhood of Crawley, and four of these emerged. It was interesting to observe the method by which the imago clings to a twig, lying backwards with its long front legs outstretched. [See pl. iii. fig. 3, Entom. No. 483.] *Plusia chrysitis* was another total failure, but I got through five specimens out of about fifteen larvæ of *Epione apiciaria*. They are rather small, but I had failed entirely with this species last year, as I had also with *Ennomos crosaria*, which latter failure has been repeated this season. Some fine imagines of *Angerona prunaria* came through, but all the females were of the light yellow type.

The above-named are all of which I reared, or attempted to rear, any numbers, all my other records being of single specimens obtained by means of the beating-stick, or by searching, &c. They include examples of *Vanessa urticæ*, *Zygæna filipendulæ*, *Cossus ligniperda*, *Dasychira pudibunda*, *Orgyia antiqua*, *Odonestis potatoria*, *Dicranura vinula*, *Pheosia dictæoides* (of which I took a female off a lamp-post on May 31st; she deposited over one hundred ova, and the imagines were bred through by Mr. L. W. Newman, of Bexley. Several imagines appeared between August 25th and 28th, but some are standing over till next year), *Thyatira derasa*, *Acronycta aceris*, *Agrotis puta*, *Agriopis aprilina*, *Hadena pisi*, *Metrocampa margaritaria*, *Phigalia pedaria*, *Biston strataria*, and *Geometra papilionaria*.

A LIST OF THE LEPIDOPTERA OF THE ISLAND OF CAPRI; WITH A FEW NOTES.

BY C. SEYMOUR BROWNE.

(Concluded from p. 286.)

THE list which I am making from my collection is, I am afraid, more imperfect than I had previously supposed. My study of the Lepidoptera of Capri was only commenced last summer, so I have not yet had sufficient time to exhaust the resources of the island. I think, however, that the list of Rhopalocera will be found to be nearly complete, though I cannot say the same of the Heterocera, the specimens obtained having been mostly found in the daytime, or taken with an acetylene lamp at night, and again I have a considerable number of specimens that I cannot name.

Many of my specimens would probably be classified as varieties, such as those contained in my series of *Ephyra pupillaria*, but, as I am not quite certain, I prefer to err on the right side, and leave them out for the present. Having had the opportunity of examining some collections in Naples, I am certain that many more species must exist than I have been able to find.

Capri has the credit of containing a variety of *Deilephila livornica*, Esp., not to be found elsewhere; also many of the Sorrentine varieties should be found here.

The Micro-Lepidoptera are rather beyond the limits of my time and patience, but I give a list of those that I have been able to find and identify.

I need hardly say that, should any reader visit this island, I should be only too pleased for him to see my collection.

Lymantria dispar is remarkable for the way in which it resists the poison of the cyanide-bottle, and I have not found it safe to set until it has been at least two hours in the bottle.

I have never taken the female of *Arctia villica* at light, but the males have appeared in large numbers, and, although plenty of the females have been found in the daytime, I have rarely seen a male.

LYMANTRIIDÆ.

944. *Ocneria rubea*, F. (One specimen, early summer, 1903.) I have not seen this in any Naples collection.

NOCTUIDÆ.

1197. *Agrotis xanthographa*, F.

1454a. *Mamestra brassica* var. *andalusica*, Staud.

1623. *Celæna matura* Hufn. (One specimen, September, 1903.)

1765. *Aporophyla nigra* Haw.

2566. *Plusia accentifera* Lef. (Two specimens, early summer); but fairly common on the mainland.

The above six species were omitted from previous list.

GEOMETRIDÆ.

2860. *Pseudoterpna pruinata*, Hufn. Scarce.
2885. *Euchloris smaragdaria*, Fabr. Very common in summer, the females coming on later than the males, of much larger size; I have one measuring 45 mm.
2897. *Eucrostes indigenata*, Vill. Common, occurring early summer, and again in autumn, the later brood being much smaller.
2907. *Nemoria pulmentaria*, Gn. Common in summer.
2988. *Acidalia rufaria*, Hb. Can be turned out of the juniper bushes in quantities in summer.
- 2988b. *A. virgularia* var. *australis*, Staud.
3011. *A. incarnaria*, H. S. Fairly scarce, late summer.
3032. *A. filicata*, Hb. Could be taken in hundreds at light.
3043. *A. degeneraria*, Hb. Common.
3064. *A. marginepunctata*, Göze. Rather a nuisance when working with a lamp.
- 3066b. *A. luridata* var. *confinaria*, H. S. Scarce.
3093. *A. imitaria*, Hb. Common.
- I have several species of *Acidalia* I cannot yet name.
3112. *Ephyra pupillaria*, Hb. Very common; shows great diversity in markings.
3115. *E. punctaria*, Linn. Two specimens, late summer, 1903.
3143. *Sterrrha sacaria*, Linn. Common; much variety in colour and marking, one specimen showing a very distinct spot on each fore wing inside the stripe, other specimens mostly a pale lemon yellow with crimson stripe.
3340. *Larentia salicata*, Hb.
3344. *L. fluctuata*, Linn.
3399. *L. nebulata*, Tr.
3434. *L. galiata*, Hb.
3481. *L. bilineata*, Linn. All the *Larentia* mentioned are easy to find. I have also several as yet unnamed.
3511. *Tephroclystia oblongata*, Thnbg.
3656. *T. sobrinata*, Hb.
3707. *Stegania trimaculata*, Vill. Scarce.
3730. *Ennomos erosaria*, Hb.
3761. *Opisthograptis luteolata*, Linn. Only one specimen, 1903.
3826. *Biston strataria*, Hufn. A few specimens in spring.
3843. *Hemerophila japygiaria*, Costa. Scarce, but occurring all through the summer.
3843. *H. abruptaria*, Thnbg. About same as *japygiaria*. I have two female specimens with wavy shell-like markings on the hind wings.
3876. *Boarmia gemmaria*, Brahm.
3901. *B. selenaria*, Hb.
3948. *Gnophos variegata*, Dup.
4077. *Aspilates ochrearia*, Rossi. Common amongst the juniper.

CYMBIDÆ.

4136. *Earias clorana*, Linn.
4142. *Hylophila bicolorana*, Fuessl.

SYNTOMIDÆ.

4146. *Syntomis phegea*, Linn. One specimen, 1902.

4156. *Dysantes punctata*. Scarce, early summer; one specimen October 20th, 1903.

ARCTIDÆ.

4168. *Phragmatobia fuliginosa*, Linn. The redness of the hind wings is much stronger than in English specimens that I have seen.

4203. *Arctia villica*, Linn.

4238. *Euprepia pudica*, Esp. Common September and October.

4248. *Callimorpha quadripunctaria* (*hera*), Poda.

4251. *Coscinia cribrum*, Linn., var. *candida*, Cyr. One specimen, 1902.

4302. *Lithosia unita*, Hb. Very common all the season.

ZYGÆNIDÆ.

4348. *Zygæna trifolii*, Esp. Will send later many additions to this family.

COSSIDÆ.

4641. *Cossus cossus*, Linn.

4718. *Zeuzera pyrina*, Linn. Very common.

PYRALIDÆ.

15. *Lamoria anella*, Schiff.

83. *Crambus pinellus*, Linn.

248. *Homæosoma nimbella*, L.

510. *Etiella zinckenella*, Tr.

645. *Salebria semirubella*, Sc.

663. *Nephopteryx rhenella*, Th.

757. *Rhodophæa suavella*, Th.

766. *Myelois cribrella*, Hb.

774. *M. umbratella*, Tr.

808. *Endotricha flammealis*, Schiff.

831. *Aglossa cuprealis*, Hb.

834. *Hypsopygia costalis*, Fabr.

836. *Pyralis farinalis*, Linn.

903. *Cledeobia angustalis*, Schiff.

922. *Cataclysta lemnata*, Linn.

930. *Stenia bruguieralis*, Dup.

949. *Scoparia ambigualis*, Tr.

984. *Agrotera nemoralis*, Sc.

998. *Glyphodes unionalis*, Hb.

1025. *Evergestis extimalis*, Sc.

1039. *Nomophila noctuella*, Schiff.

1042. *Phlyctænodes palealis*, Schiff.

1072. *Antigastra catalaunalis*, Dup.

1073. *Mecyna polygonalis*, Hb.

1151. *Pionea ferrugalis*, Hb.

1218. *Pyrausta nubilalis*, Hb.

1253. *P. aurata*, Sc.

1406. *Stenoptilia bipunctidactyla*, Hw.

DESCRIPTION OF A NEW SPECIES OF THE FAMILY LEMONIIDÆ.

By EMILY MARY SHARPE.

ABISARA HUNTEI, n. sp.

Allied to *A. wallacei*, Hewits., but differs from that species in having a large white patch on the anal angle of the hindwing.

Forewing. Ground colour brownish black, relieved on the apical area by three medium-sized white spots, situated between the subcostal and radial nervules.

Hindwing. General colour brownish black, a large white patch on the anal angle extending along the hind margin to as far as the radial nervule; the nervules terminating in brownish black spots on the white area.

Underside. Ground colour duller brown than in *A. wallacei*, but with the greyish white lines visible on the forewing. The hindwing similar to that of the forewing in colour; the usual submarginal row of black spots is in this species represented by only three spots, extending from the apex to the third median nervule, the last of these three spots being plainly conspicuous on the midst of the white patch. The orange band only indicated between the radial nervule and the first subcostal nervule. All the nervules terminate in the hind margin in black spots. Abdomen orange-yellow as well as the legs and palpi. Expanse, 2 inches. ♂.

British New Guinea.

In the collection of Sir George Rutheven Le Hunte.

Lyndhurst, 4, Barrowgate Road, Chiswick.

CURRENT NOTES.—No. 2.

By G. W. KIRKALDY.

(Concluded from p. 287.)

A. L. MONTANDON (5) has given us another of his valuable essays on aquatic Rhynchota. The genus *Nepoidea* is confirmed as identical with *Curicta*, Stål, and to these is added *Helotenthes*, Berg;* *Cercotmetus* is discussed and defined; while the *Abedus-Deinostoma* group is reconsidered, Montandon confirming his original opinion that *Abedus*, *Serphus*, *Stenoscytus*, *Pedincoris*, and *Deinostoma* are one genus only, though he makes the concession of three subgenera. Much abstruse synonymy in the *Belostoma-Zaitha* groups is elucidated, but in one point I regret I cannot follow my friend Montandon. I cannot agree to the

* Von Ferrari and Montandon refer to this as "*Helotentes*," and other authors as "*Heloteutes*," but Berg's spelling is "*Helotenthes*."

effacement of the genus *Diplonychus* in favour of *Sphærodema*. Laporte founded the genus *Diplonychus*, with two subgenera, *Diplonychus* and *Sphærodema*. Subsequently, in the same essay, he discovered that the type of the former belonged to the latter; consequently the subgenus *Diplonychus* falls; but the subgenus *Sphærodema* is only a part (now actually the whole) of the genus *Diplonychus*, which I think ought to stand.

H. J. HANSEN (6) has published another of his valuable monographs on the orders of the Myriapoda, which, though not strictly entomological in the usual restricted sense of the word, are indispensable to anyone interested in the phylogeny of the Arthropoda. The treatment of the descriptions and the illustrations are in Dr. Hansen's usual well-known style. I presume the date of publication is May or June, 1903, but it is surprising that a journal of the reputation of the 'Quarterly' has indicated the date neither on any page nor on any plate, nor on the cover of the separate copy before me.

Another part of the voluminous "Species des Hyménoptères d'Europe" has appeared (10a). In this J. J. Kieffer continues the account of the Cynipidæ, the present fascicule comprising the Zoophaga, the Allotrinæ, and Eucoilinæ being discussed, together with a part of the Figitinæ. The first named was termed Aphidivoræ by Giraud, since its representatives live in the larval state in the body of Aphidæ or Coccidæ. They are found so far throughout the palæarctic region, while a few species have been discovered in North America. They doubtless occur also in other regions. The Eucoilinæ (Eucelinæ) are, so far as is known, parasitic on the larvæ or puparia of Diptera, or of the larvæ of Coleoptera. The Figitinæ also are parasitic on the larvæ of Diptera, Coleoptera, and Neuroptera. The treatment is on an ample scale, consisting of systematic descriptions of all stages so far as possible, analytical keys, and biological notes, thus making the work of high interest not only to hymenopterists, but also to rhynchotists and dipterists, and, in a less degree, to specialists in other orders.

The first volume contained nearly 700 pages, with 27 plates; the second, so far as completed, nearly 300 pages, with 9 plates. The work is published in Paris, at the Librairie Scientifique A. Hermann.

E. P. FELT has published a thoroughly practical paper on the literature of American Economic Entomology (7), read before the last meeting of the Association of Economic Entomologists. Dr. Felt calculates that the enormous number of 12,163 articles on economic entomology in America alone have been issued since 1860; this including newspaper articles, reports, bulletins, &c., and being probably below the total. He places great stress on the educational value of newspaper articles carefully written by competent men, not only as a counteraction to the uninformed

and frequently ridiculous attempts of the unscientific reporter, but also because he believes that newspaper articles are more generally read than the more detailed and less popular notices in reports and bulletins. A brief and interesting historical *résumé* of the history of economic literature in America concludes with remarks on indexing and ideal schemes of publication. The same author discusses (8) a number of injurious insects introduced from abroad, the depredations of some of these becoming more and more apparent and difficult to combat. Six species affecting fruit trees, two affecting shade trees, and six injuring cotton are noted as principal offenders, and many others, either minor though still sufficiently noxious, or recently introduced and probably destined to become destructive, are noted. This paper will be specially interesting to European entomologists, the species mentioned being often common though little harmful in their continent.

Dr. FELT has also (9) recently issued his fifth Report as State Entomologist of New York. This, again, is of special interest to British entomologists, one of the *pièces de résistance* being a discussion of *Euproctis chrysorrhœa*, the brown-tail moth, which has recently become established in Massachusetts, Maine, and New Hampshire. As every British lepidopterist knows, it occurs over the whole palæarctic region with but little exception. It has not yet penetrated to New York State. "It is not often that an insect is destructive to vegetation and also markedly injurious to man, and yet this is true of the above-named species. The hairs of the caterpillar of this species, coming in contact with the human flesh, produce 'a fierce and enduring irritation,' as characterized by Mr. A. H. Kirkland: and so annoying and prevalent was this that the board of health of the city of Boston gave a public hearing on the subject in 1901." The irritation is stated to be mechanical, and not due to any poisonous irritant substance in the hairs. Injurious as the depredations of *Euproctis* are, however, the American birds and insect parasites have already proved very efficient in stemming the tide; a number of birds are quoted as devouring the moths and caterpillars. Forbush recorded "the number of larvæ eaten by each bird and the time occupied. None eat less than nine, and one as many as fifty-seven caterpillars; the latter operation occupying twenty minutes." A beautiful coloured plate by L. H. Joutel shows the metamorphoses, &c., of *E. chrysorrhœa*. Among other figures are the work of *Cryptorhynchus lapathi* (Coleopt.); *Psilura monacha*; *Bucculatrix canadensisella* (Lepid.) and its work.

It is now more than time to notice Distant's invaluable "Rhynchotal Notes" (10), which consist of a revision of the Walkerian genera and species, with descriptions of numerous novelties from the rich collections of the British Museum and of

the author himself. The families contained in the first two volumes of Lethiery and Severin's Catalogue, and about two-thirds of the third—in fact, the most recent—17th—part, completing the Reduviidæ down to the end of the Nabinae—are dealt with. Walker fortunately described comparatively very few Miridæ, and practically no Cryptocerata, so that, although the museum collections are very rich in some of these forms, we may hope to see very soon the completion of the Heteroptera, and with the commencement of the Homoptera, in the Cicadidæ, the author falls upon one of his favourite families.

Among other recent contributions to entomological literature, which I can unfortunately notice very briefly, are:—

11. L. ZEHNTNER: "Rapport over de mottenbestrijding of de Onderneming Banaran, 1901-1902," Proefstation voor Cacao te Salatiga, no. 5, Nieuwe Gids iv. afl. 11 and 12, pp. 1-53, with a graphic chart for twelve ensuing years; Apl. 1903. This discusses fully the depredations of the lepidopteron *Zaratha cramerella*, Snellen, on the cocoa plantations of Java.

12. N. BANKS: "An Index to Bulletins 1-30 (new series) (1896-1901) of the Division of Entomology," U. S. Dep. Agr. Div. Entom. Bull. 36, n. s. (1902). The accuracy and usefulness of these indexes are indisputable; a slight improvement would have been the recapitulation on one page of the titles of each of the bulletins.

13. C. M. WEED & A. F. CONRADI: "The Whitefly of Green-houses," Bull. 100, N. Hampsh. Coll. Agr. Exp. Sta. pp. 45-52, figs.; March, 1903. An account of a species of the rhynchotal genus *Aleurodes*; its life-history, depredations, and control by hydrocyanic acid gas.

14. G. DEL GUERCIO: "Contribuzione allo studio dei Diaspini dell' olivo," Bull. Soc. Ent. Soc. Italiana, xxxiv. pp. 179-188, ten text figs. (Mch. 20th, 1903). A study of certain Coccidæ of the olive [Rhynchota].

15. A. DUCKE: "As especies paraenses do genero *Euglossa*, Latr." [Hymen.], Bol. Museu Paraense, iii. 561-79, plates; Dec. 1902. The bulletin of this museum contains periodical bibliographical notices of works relating to South America.

16. P. CHRÉTIEN: "Les Erebica de France" [Lep.], Le Naturaliste, xxv. pp. 71-2 (15th March, 1903). Twenty-one species credited to France.

17. H. M. LEFROY: "Scale Insects of the West Indies," West India Bull. iii. pp. 240-70 and 295-319 [Rhynch.]. The Coccidæ of the Lesser Antilles (St. Lucia, St. Vincent, Guadelupe, &c.) are discussed; the region being thought to represent a "fairly definite zoological area."

18. L. REH: "Biologisch-statistische Untersuchungen an amerikanischen Obst-Schildläuse," Zool. Jahrb. xvii. pp. 237-84,

1903. Extensive biologic-statistic researches on the American Coccids destructive to fruit.

19. W. C. THRO: "Distinctive Characteristics of the Species of the Genus *Lecanium*," Bull. 209, Cornell Univ. Agr. Exp. Sta. Ent. Div., pp. 201-21 (? *), five plates; Jan. 1903. The object of this paper is to "gain a knowledge of those external features that are available for distinguishing the [American] species" of the genus *Lecanium* [recte *Coccus*], and is based largely upon the setæ, &c.

20. J. C. H. DE MEIJERE: "Ueber die Prothoracalstigmen der Dipteren-puppen," Zool. Jahrb. xv., Anat. Abt., pp. 623-92, four plates, 1902.

21. C. SCHRÖDER: "Die Zeichnungs-Variabilität von *Abraxas grossulariata*, L. (Lep.), gleichzeitig ein Beitrag zur Descendenz-Theorie," Allg. Zeit. für Ent. viii. (Apl. 1st, 1903), pp. 105-19, thirty-five text figs. The first part of a paper on temperature experiments on the pattern-variability of *Abraxas grossulariata*. One hundred figures are promised, of which thirty-five appear in this first instalment.

22. A. D. IMMS: "*Clunio bicolor*, Kieff., marine Chironomid new to the Fauna of Great Britain," Trans. Liverpool Biol. Soc. xvii. pp. 81-6, three text figs., 1903. Supplemental to his "Notes on the Genus *Clunio*, Hal." (Entom. 1902, pp. 157-8), by an account of *C. bicolor*, which he found "skimming over the surface of the rock-pools on the shores about Port Erin, Isle of Man."

23. K. NAGANO: "*Chærocampa oldenlandii*, Fab. (Sesujisuzume)," Insect World, vii. no. 3, Mch. 15th, 1903, English suppl., one pl. with col. and plain fig. [Lep.]

24. K. NAGANO: "*Protoparce orientalis*, Butler (Ebigarasuzume)," t. c., no. 4, Ap. 15th, 1903, Engl. suppl., one pl. with plain and col. fig. [Lep.]

25. K. NAGANO: "*Diludia increta*, Walker (Shimofurisuzume)," t. c., May 15th, no. 5, Engl. suppl., one pl. with fig.

Protoparce orientalis, which Mr. Nagano thinks identical with *Sphinx convolvuli*, is recorded from several Japanese localities, July to September. The larva is described and noted as occurring on *Ipomœa batatas*, *Calystegia sepium*, *Pharbitis hederacea*, and *Tetragonia expansa*. The *Chærocampa* is recorded from the same localities during May to June. The larva is described and recorded from *Colocasia antiquarum* and *Pinellia tuberifera*, July to September. In this number of the magazine figures appear of sexes and varieties of the Coleoptera *Lucanus maculifemoratus* and *Cladognathus inclinatus*. *Diludia increta* is recorded from Kiusiu, Shikoku, and Housiu during July and August; the larva is noted on a number of plants, July to September.

* I have only the separate bulletin before me, and am not certain of the exact pagination.

26. A. BERLESE: "Importanza nella economia agraria degli insetti endofagi distruttori degli Insetti nocivi," Boll. Scuola Agric. Portici (2)4, pp. 1-27, 1902. Berlese discusses the importance of such predatory insects as the *Coccinella*, *Cochylis*, *Pteromalus*, &c., in checking the ravages of insects injurious to crops, &c.

27. N. CHOLODKOVSKY: "Ueber den Hermaphroditismus bei *Chermes*-Arten," Zool. Anz., 1902, pp. 521-2, three text figs. [Rhynch.] Hermaphroditism discussed in certain Aphidæ.

28. A. PORTA: "Ricerche sull' apparato di secrezione e sul secreto della *Coccinella 7-punctata*, L." [Col.]

29. O. SCHULTZ: "Varietäten und Aberrationen von *Papilio podalirius*, L., uebersicht über die Variabilität dieser species" [Lep.], Berl. Ent. Zeit. 47, pp. 117-33, 1902.

30. J. B. SMITH: "Report of the Ent. Dept. of N. Jersey Agric. Exp. Sta. for 1902"; 1903, pp. i-iv and 423-593, 16 figs. (many full or double page). This is of the usual type of Dr. Smith's well-known Reports, being largely occupied by a detailed account of his mosquito experiments.

31. S. A. FORBES: "Twenty-second Report of the State Entom., Illinois"; 1903, pp. i-viii, 1-149 and i-xx, 33 figs. (many full page). This valuable Report is largely taken up with discussion of field work against the San José scale, and notices of the "Corn Bill-bugs" (*Sphenophorus* spp.), a genus of Rhynchophorous Coleoptera.

32. K. ESCHERICH: "Beiträge zur Kenntniss der Thysanuren," Zool. Anzeiger, 14th Apl., 1903, pp. 345-66, twelve text figs. A valuable contribution to our knowledge of certain Thysanura.

NOTES AND OBSERVATIONS.

ABUNDANCE OF *PYRAMEIS CARDUI*.—The occurrence in England of large swarms of *P. cardui* may be due, as Mr. Mathew suggests, to a prevalence of easterly gales which drive them across from Norway, Denmark, or France. But it will generally be found, I think, that when this species is exceptionally abundant in England, it is equally so on the Continent; and it is possible that the same mysterious procreative agencies may be at work in both cases. This is, I suppose, what may be called a *cardui* year, for my garden here is alive with them all day long, and on the heliotrope, covering a piece of wall ten yards long by eight feet high, I saw at 11 o'clock on the morning of Nov. 6th, at a moderate computation, between seventy and eighty at one time, the majority rather worn, but many quite fresh. The appearance of vast multitudes of certain species at irregular intervals is a problem still awaiting solution. I remember a year—'81 I think—when *Plusia gamma* lay so thick for a mile or more along the beach at Cromer that it was impossible to move without stepping on them. It has been suggested that many pupæ lie over and accumulate from

year to year until some fortuitous conjunction of wind and weather starts them into life. This may or may not be the solution, but the whole subject, I think, is still shrouded in a good deal of mystery.—R. S. STANDEN; Villa Gaia, Bordighera, Nov. 11th.

COINCIDENCE OF PYRAMEIS CARDUI AND PLUSIA GAMMA.—The abundance of *P. cardui* in most of our south-eastern counties this year has been sufficiently established by the many published notices which have appeared in this magazine and other newspapers or periodicals. Incidentally I may mention that from Sept. 23rd onward to about Oct. 16th or 17th, Michaelmas daisies in the garden here proved a great attraction to the species, which occurred in some numbers; while at South-end-on-Sea the ivy-blossom and other flowers in "The Shrubbery" were equally well patronized. This year, as on former occasions, however, I have observed that *P. cardui* has come attended by a profusion of *P. gamma*; and, curiously enough, the last great flight I can recall, viz. in August, 1879, was remarkable, as I find by my notes, at Hunstanton in Norfolk, for a similar coincidence there. The summer of the last year of the seventies enjoyed the reputation of one of the rainiest known; 1903 has broken the record in this respect. The interesting question therefore presents itself, how far the weather may be accountable for the visitation of *P. cardui*, and to what extent climatic conditions influence an abnormal and concurrent abundance of *P. gamma*. I have no note in this connection on 1888, another year marked as rainy beyond endurance. Perhaps some of your correspondents can furnish dates with regard to the then abundance, or otherwise, of both or either species. At present, again, we are very much in doubt as to the origin of the swarm of *P. cardui* which descended on the British coast in September, while the perfect condition of the *P. gamma* observed certainly discredits foreign origin altogether, though *Plusia* as a genus has a well-known tendency to wander. In certain parts of Holland, I understand, *P. cardui* occurred commonly enough this year, but not in such quantities as to suggest overcrowding, one of the supposed, but by no means established causes of emigration.—H. ROWLAND-BROWN; Oxhey Grove, Harrow Weald, Nov. 10th.

EXTENDED EMERGENCE OF NOTODONTA DICTÆA.—On Aug. 6th, 1902, I bred a large female of this species from a dug pupa. She emerged during the night, and had considerably damaged herself in the breeding-cage; so the following evening I tied her to the trunk of a poplar-tree in my garden, and next morning found her paired with a fine male, and in the course of a night or two a large number of eggs were deposited in the chip box in which she was confined. These were divided into four or five different lots, and sleeved out on poplar branches, and duly fed up and went to earth. The first moths, two in number, emerged on May 16th, 1903, and they continued to appear, by twos and threes, nearly every day until August 26th, by which time I had bred over two hundred. Rubbed females, placed out on May 25th and June 2nd, paired with wild males, and some of their progeny began to appear before all the 1902 brood had ceased to emerge. This species generally leaves the pupa between 10.30 p.m. and 1 a.m., and directly their wings are dry they become restless and

fly about, and soon injure themselves; but there were exceptions, for some emerged in the forenoon, some in the afternoon, and others early in the evening.—GERVASE F. MATHEW; Dovercourt, Essex, Nov. 14th.

VAGARIES OF THE SEASON.—Yesterday afternoon, Oct. 26th, a very fine female of *Arctia caia* emerged in my breeding-box. This was from the larva found on Sept. 21st (*ante*, p. 289).—HUGO HARPUR CREWE; Stanleys, near Brockenhurst, R.S.O., Hants.

CAPTURES AND FIELD REPORTS.

COLIAS EDUSA, &C., IN CORNWALL.—On Sept. 14th last I saw a fresh specimen of *C. edusa* flying over the West Cornwall golf-links (Lelant), and on the 26th of the same month two more on the Hayle towans on the other side of the river, not far from the beach, and a fourth the next day in the same place.

PYRAMEIS CARDUI was common in those parts about this time. A larva of *Charocampa porcellus* was found on the towans near the edge of the cliff. It has since become a pupa.—HAROLD HODGE; 9, High-bury Place, London, N.

LAPHYGMA EXIGUA IN YORKSHIRE.—In 'The Naturalist' for November Mr. Thomas Fieldhouse records the capture of eight specimens of *L. exigua* near Keighley. They were attracted by his lamp when searching for the females of *Scotosia dubitata* on Sept. 22nd last. Mr. G. T. Porritt, who saw three of the specimens whilst on the setting-board, confirms the identification, and remarks that only three specimens of the species had previously been recorded as occurring north of London.

PLUSIA MONETA IN NORTHAMPTON.—On July 29th a fine specimen of *P. moneta* came into my house. This capture seems interesting, as showing that the insect is gradually being distributed over the country.—H. TURNER; Earl's Barton, Northants.

PLUSIA CHRYSITIS IN SOUTH LONDON.—With reference to Mr. Lawrence's note on *Plusia chrysitis*, I have been in the habit of taking the species sparingly here during the last ten years; of late specimens seem to have become fewer and farther between.—STANLEY A. BLENKARN; Clifton House, East Dulwich Road, S.E., October 4th, 1903.

PLUSIA CHRYSITIS IN SOUTH LONDON.—I was somewhat surprised to learn from Mr. Dannatt's note (*ante*, p. 242) that it is the first time he has captured *Plusia chrysitis* so near London. For the last twenty-five years I have been in the habit of taking both this species and *Triphæna ianthina* in the garden and in Kidbrooke Lane.—STANLEY EDWARDS; 15, St. Germans Place, Blackheath, Sept. 26th, 1903.

ACIDALIA STRAMINATA VAR. CIRCELLATA IN DELAMERE FOREST.—I netted a fine specimen of the above species in Delamere Forest on July 11th last. I am indebted to Mr. Charles G. Barrett for kindly identifying this little geometer.—J. ARKLE; Chester.

ABRAXAS GROSSULARIATA: SECOND BROOD.—As a sequel to my paragraph of last month (*ante*, p. 289) I should like to say that I have bred in all about thirty imagines of this moth, only two or three of which exhibit any striking variation. Two specimens also I captured outdoors, and this is most interesting to me, one on November 4th, on the outside of the kitchen window, where it was fluttering towards the light of a lamp inside. The second specimen I took off the garden fence in the middle of the day, Nov. 14th, the empty pupa-case being just below it. The first was taken on a cold night, inclined to frost and fog. The second was captured on an unusually sunny and mild November day. I have tried to get eggs from some of the moths to continue breeding it, but have only succeeded in getting a few infertile ones. Four parasitic Diptera have appeared, kindly identified for me by Mr. C. Morley, of Ipswich, as *Blepharidea* (*Exorista*) *vulgaris*. This second brood of parasites also seems to me an interesting fact.—E. G. J. SPARKE; Tooting, S.W., Nov. 19th.

ABRAXAS GROSSULARIATA: SECOND BROOD.—I was very much interested in Mr. Sparke's note on *A. grossulariata* (*ante*, p. 289). As I have lately taken a number of pupæ here, I should like to record my experience of this somewhat unusual occurrence. I took the first lot of autumn pupæ of the species on Oct. 28th, about eighty odd. These were left in the pill-box, and on looking at them on Oct. 28th I found that one imago had emerged. From the above date, and up to Nov. 16th, I collected over five hundred and eighty larvæ and seven hundred and eighty pupæ, total one thousand three hundred and sixty. I may mention that at the time of writing most of the larvæ have pupated. One hundred of the pupæ have been placed in a perforated box outside, so as to see if the imagines will emerge naturally. All the larvæ and pupæ were taken off the currant and gooseberry bushes; in some instances as many as seven pupæ were found side by side. I may add that the first autumn brood of *A. grossulariata* that I had ever seen was in 1898, when I took over three hundred pupæ, and the old collectors here said that they had never seen the like before.—O. TIPPINS; The Lodge, Dingle Bank, Liverpool, Nov. 11th, 1903.

[Mr. Sich (*Entom.* xxx. 176) records the finding of a larva of *A. grossulariata* on Oct. 15th, 1896. This pupated on Nov. 19th, and attained the perfect state on Dec. 24th.—ED.]

AQUATIC HEMIPTERA IN SOUTH LANCASHIRE.—During the summers of 1902 and 1903 I have taken the following water-bugs about Bolton:—*Velia rivulorum*, Fab. = *currens*, Fab., and *Gerris lacustris*, Linn. were both very plentiful, the former on streams and the latter on ponds. *G. costæ*, H. Schf., three specimens in 1902. *Nepa cinerea*, Linn., not common, *Notonecta glauca*, Linn., and var. *furcata*, both forms common and equally plentiful in 1902, but somewhat scarce in 1903. *Corixa geoffroyi*, Leach, scarce in 1902, but exceedingly abundant last summer (August). The following species of *Corixa* were all common:—*sahlbergi*, Fieb., *mæsta*, Fieb., *nigrolineata*, Fieb., *fossarum*, Leach, and *præusta*, Fieb.; but the last mentioned was restricted to one pond, in an elevated situation. Occurring in fewer numbers were *striata*, Fieb., and *distincta*, Fieb.; while *hieroglyphica*, Duf., *linnaei*, Fieb., *fallenii*, Fieb., *limitata*, Fieb., *venusta*, D. & S., and

semistriata, Fieb. were rare. As far as my experience goes, *semistriata* is usually a pale species, but last summer I took a specimen which was as dark as the average *fossarum*. I also had the good fortune to capture two specimens of *scotti*, Fieb.—OSCAR WHITTAKER; 39, Clarendon Road, Whalley Range, Manchester, Nov. 12th, 1903.

NOTES ON CAPTURES, 1903.—The past season has been one of the most disappointing, and one of the most unfruitful in interesting captures, that has occurred for many years, and although the neighbourhood has been worked rather more assiduously than usual, the result has been almost nil. Sugar, although persisted in with considerable regularity, has been nearly a blank, both in the variety of species and, with the exception of one week in the early part of August, in the number of insects seen. The only noteworthy captures were two specimens of *Tethea subtusa*, which is rare in this district. A rather curious occurrence was that of two *Polia flavicincta*, taken at rest on two different days on the brick pillar of a gateway in the middle of the town. This species, which we have never met with before in this neighbourhood during an experience of some fifty years, may perhaps have been recently introduced among garden plants from another district. Neither this nor *T. subtusa* is recorded in the only Chatteris list extant—that given in 'The Fenland,' published in 1878, a list to which we have been able to make a good many additions within the last few years.

Two days were spent on Chippenham Common, where the only species in any number were *Rivula sericealis* and *Catoptria scopoliana*. One specimen each of *Toxocampa pastinum* and *Bankia argentula* and a pair of *Stigmonota orobana* were taken; unfortunately the latter were hastily set down for *Dicrorampha petiverella*, a species it somewhat resembles; had its food-plant, *Vicia sylvatica*, been searched, more might have been taken. *Phytometra ænea* was fairly plentiful and in fine condition, the insects appearing a fine rich red as they flew in the sunshine.

A rough windy day at Wicken Fen was entirely unproductive, with the exception of four larvæ of *Papilio machaon*, the lovely colouring of which rendered irresistible the desire to bring them away.

A day or two's collecting in the neighbourhood of Hunstanton produced only two species we had not taken before, *Crambus fascellinus* and *Agdistes bennetii*; two examples of the former were taken at dusk among *C. inquinatellus*, and although the sand-hills and salt-marshes were subsequently hunted indefatigably, both in the daytime and at dusk, no more specimens were met with.

Agdistes bennetii appeared on two evenings only, and seem to fly for some fifteen to twenty minutes just before dark, when they are most difficult to see. They are apparently non-existent in the daytime, and were not to be found after the moon had risen. This species also, though appearing in some numbers on these two evenings, disappeared absolutely, and, notwithstanding some hours spent in looking for them afterwards, not another one was seen.

It is a question of some interest how far the cold and wet of the past summer will affect the prospects of next season; the scarcity of the past season was to a certain extent one both of species and of

individuals, for, as far as our experience went, many species which generally occur did not put in an appearance at all, and, with the exception of such common ones as *Xylophasia polyodon*, *Agrotis nigricans* and *Noctua xanthographa*, those which were observed were present in much smaller numbers than usual.

Thus the question arises, has the bad weather proved fatal to many insects? or are they lying over in the pupal state? This, as in the case of most other sublunary affairs, "time will show."—J. C. F. and H. F. FRYER; The Priory, Chatteris, 6th Oct., 1903.

COLLECTING AT CHEXBRES IN JULY, 1903.—LEPIDOPTERA.—*Colias edusa*, fairly common along line of rail in the valley of the Rhone. *C. hyale*, only a few seen, one noticed in the vicinity of Bex railway station, July 7th; another captured in meadow at Brigue, July 13th; and a third (a female) at Berisal, on the Simplon, July 14th. *Pieris cratægi*, fairly common, captured at Gryon, July 7th; at Chexbres, July 11th; Brigue, July 13th; Berisal, July 14th. *P. napi*, captured one of Alpine var. *bryonia* of this species at Berisal, July 14th. *Leucophasia sinapis*, common along line of rail in the valley of the Rhone; also at Chexbres, July 11th, 20th, 24th; at St. Nicholas, July 22nd, 23rd. *Parnassius apollo*, two or three seen between St. Nicholas and Vierge, along the mountain railway, July 23rd. *P. mnemosyne*, abundant in hay meadow close to the hotel at Berisal, July 14th. This was the first occasion on which I had ever seen this butterfly alive, and with the kind aid of the son of the vicar of Stoke-on-Trent, who was also staying in the hotel and happened to be an entomologist, I was enabled to capture a good series of the species, including five or six of its dusky var. *nebulosus*. It is decidedly feebler and slower in flight than its congener *P. apollo*, and some of the specimens proved rather worn and tattered, which circumstance is not to be wondered at, as the recorded time of its flight is during May and June. It frequently dives down to the roots of the grass if simply covered by the net without getting enclosed in the bag, a habit which I do not recall in *P. apollo*, and which should be borne in mind by those who wish to obtain this butterfly. I soon learned to distinguish it even at a distance from *P. cratægi*, which also occurred in the same field, as the latter insect is noticeably whiter, swifter in flight, and occasionally larger than *P. mnemosyne*. Several of the specimens of *P. mnemosyne* which I captured had a portion of the pupa-case still adhering to the lower end of their bodies. *Gonepteryx rhamni*, one seen at St. Nicholas, July 22nd. *Satyrus ianira*, common at Chexbres and St. Nicholas. *S. mæra*, fairly common at Chexbres and St. Nicholas and Gryon. *S. semele*, fairly common at Chexbres and St. Nicholas. *Melanargia galatea*, very common at Chexbres and St. Nicholas; does not apparently disappear so universally as other Swiss species when the grass is mown. *Argynnis aglaia*, very common, Chexbres, valley of the Rhone, &c. *A. pales*, a few in direction of Simplon Hospice, July 15th. *A. lathonia*, three specimens captured, two in the neighbourhood of Chexbres, and one in the direction of Simplon Hospice, July 15th. *Melitæa didyma*, four specimens captured at St. Nicholas, July 22nd. *M. amathusia*, one captured at St. Nicholas, July 22nd. *Chrysophanus chryseis*, one captured at Berisal and another at Gryon. *C. virgaurea*,

one captured at Berisal. *Cænonympha arcanius*, one captured in direction of Simplon Hospice. *C. pamphilus*, at Chexbres, not plentiful. *Ercbia gorge*, Chexbres, not common. *Polyommatus ægon*, common along winding road on ascent to Berisal, July 14th. *P. corydon*, common at St. Nicholas, July 22nd. *P. adonis*, noticed at Chexbres, July 9th. *P. alexis*, common at Chexbres. *Vanessa urticae* a few seen. *V. antiopa*, one fine specimen noticed flying across the road high over head in ascent to Berisal, July 14th. *V. c-album*, one noticed in neighbourhood of Chexbres. *Pamphilus sylvanus* and *P. thaumas (linea)*, neighbourhood of Chexbres; neither of these two species abundant. *Mimoiis hermione*, one or two of this species noticed along mountain railway between Zermatt and Viege. *Zygæna filipendula* and *Tanagra chærophyllata* were both common at Chexbres. *Odonestis potatoria*, *Lasiocampa quercus*, *Smerinthus tiliæ*, given me by the son of my landlord, Hotel Victoria, Chexbres.

NEUROPTERA.—*Calepteryx virgo*, quite the commonest neuropterous insect noticed, along water-courses on either side of Chexbres railway-station, frequently settling on the hazel-bushes. *Libellula quadrimaculata*, two captured and a few more seen by shore of Lac de Bret, about two miles from Chexbres and along the road thither. *Orthetrum cancellatum*, one or two females taken in direction of Lac de Bret.

COLEOPTERA.—*Cetonia aurata*, very common at Chexbres and St. Nicholas, especially on the angelica; some also on roses, and others on thistles. *Melolontha vulgaris* and *M. solstitialis*, both very common at Chexbres. *Trichodis*, fairly common, Chexbres, St. Nicholas and Bex. *Carabus splendens*, five captured at Chexbres.

HYMENOPTERA.—*Vespa sylvestris*, becoming commoner at Chexbres as July advanced, on angelica. I may add that this year butterflies were far less plentiful at Chexbres, both in number and species, than in July, 1893.—(Rev.) F. A. WALKER; Dun Mallard, Cricklewood.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—October 7th, 1903.—Professor E. B. Poulton, M.A., D.Sc., F.R.S., President, in the chair.—Mr. F. M. Littler, Althome, High Street, Launceston, Tasmania; Mr. H. Swale, M.B., Arawa House, Rotorua, New Zealand; Colonel Jesse Griggs Pilcher, I.M.S., F.R.C.S., 133, Gloucester Road, Kensington, S.W.; Mr. S. A. Neave, B.A., Magdalen College, Oxford; and Mr. C. A. Wiggins, Kisumu, Lake Victoria Nyanza, British East African Protectorate, were elected Fellows of the Society.—Mr. G. C. Champion exhibited, on behalf of Professor Hudson Beare, some specimens of a *Pinus* new to the British list, captured in a granary at Strood, on May 11th, 1901.—Mr. C. O. Waterhouse exhibited, on behalf of Mr. Charles Pool, specimens of a beetle of the genus *Niphus* closely resembling *N. crenatus*, but with distinct shoulders, and more parallel and less strongly striated elytra. They were found in large numbers in a corn-chandler's at Edmonton.—Mr. H. St. J. Donisthorpe exhibited specimens of *Aphanisticus emarginatus* from Parkhurst Forest, a beetle new to the British list, and a *Scymnus* new to science,

from Yarmouth, I. W.—Mr. M. Burr exhibited a living adult male earwig, *Labidura riparia*, Pall., captured near Boscombe at the end of August, 1903. He said that the very noticeable pale coloration becomes darker after death, sometimes nearly black, which might account for some of the numerous "colour-varieties."—Dr. Norman Joy exhibited a specimen of *Argynnis selene*, taken last year in Berkshire, showing a remarkable tendency to melanism. He also exhibited rare Coleoptera taken in the same county during 1903.—Sir George Hampson exhibited a collection of Norwegian butterflies made by him on the Dovrefjeld, on the Alten fiord, at Bossekop and other localities this year. The specimens included fine series of *Colias hecla*, Lef., *Chrysophanus hippothoë* var. *stieberi*, Gerh., *Aeneis norna*, Thnb., *Melitæa* var. *norvegica*, Auriv., the Norwegian form of *M. aurelia*, *Argynnis freija*, and *A. frigga*, a Labrador, arctic, and North American species, now found further south at Kongsvold for the first time.—Mr. A. H. Jones exhibited examples of *Erebia christi*, taken this summer in the Laquinthal, and of the species of *Erebia* to which it is allied; a local form of *Satyrus actæa*, var. *cordula*, captured last July at Sierre; and a short series of *Chrysophanus doris* (type) and *C. var. subalpina* from the Laquinthal, with *P. hippothoë* var. *eurybia*, showing the strong resemblance on the upper surface which the female of this latter species bears to the female *subalpina*.—Mr. A. J. Chitty exhibited specimens of a Proctotrupid which he said approached *Ponera constricta*, Latr., in appearance, and might be an *Isobrachium*. If so it was new to the British list.—Mr. H. Willoughby Ellis exhibited *Criocephalus polonicus*, Motsch., a Longicorn beetle new to Great Britain, from the New Forest, and also specimens of all stages from the egg to the imago, to illustrate the life-history of the species which he explained. He also exhibited *Asemum striatum*, L., with larva and pupa, accounted heretofore rare in the New Forest, but this year occurring in abundance.—Mr. Ambrose Quail exhibited cases showing the life-history of some Australian Hepialidæ.—Dr. D. Sharp, F.R.S., exhibited specimens illustrative of the egg-cases and life-history of eight species of South African Cassididæ, as described in a paper by Mr. F. Muir and himself.—Mr. W. L. Distant also showed the pupa cases of some African species of *Aspidomorpha* with the cast heads of the larvæ.—Mr. Roland Trimen, F.R.S., exhibited some cases of mimicry between butterflies inhabiting the Kavirondo-Nandi district of the Uganda British Protectorate, particularly that in which *Planema poggei*, Dewitz, is imitated by an apparent variety of *Pseudacraa kinowii*, Dewitz, and also by a hitherto undescribed form of the polymorphic female *Papilio merope*, Cram. This makes the fourth pronounced known form of the female *Papilio merope*. The usual and generally distributed form of this sex throughout Tropical Africa is that named *hippocoön* by Fabricius—an excellent mimic of *Amauris niavius*, L.; all the other forms appear to be very rare, and two of them—*dionysos*, Doubl., and the form from Zanzibar described in the Presidential Address to the Society on January 19th, 1898—are not direct mimics of any other butterflies, but are least divergent from the non-mimetic coloration and pattern of the male.—The President congratulated Mr. Trimen on the exhibit, and the special interest attaching to an interpretation of this remarkable form of the female *merope*. At the

same time he pointed out that the interpretation so convincingly illustrated that evening had been made out last spring by Mr. S. A. Neave, who exhibited this form of the female *merope* together with *Planema poggei* as its model at both soirées of the Royal Society in May and June, a time when Mr. Trimen's absence from England unfortunately prevented him from seeing them.—Dr. T. A. Chapman exhibited *Cænonympha ædipus*, *Satyrus dryas*, and *Heteropterus morpheus*, taken last summer near Biarritz; and *Erebia evias* and *E. stygne* from the Logroño Sierra, Spain. These respectively he suggested were probably examples of homœochromatism. Little attention has been directed to homœochromatism in European butterflies, and these were certainly not examples of the detailed mimetism we are now familiar with in Müllerian groups from the African and neotropical regions.—Dr. Chapman also exhibited living imagines of *Crinopteryx familiella*. These had just emerged at Reigate, where they and their parents, descended from pupæ brought from Cannes in March, 1901, had lived out of doors during their active existence, being brought into the house only during their pupal aestivation. This seemed noteworthy in so southern (Mediterranean) a species. The experiment seemed quite likely to continue successful for the next generation.—Mr. Ambrose Quail read papers "On the Antennæ of the Hepialidæ," and "On *Epalxiphora axenana*, Theyr."—Mr. Gilbert J. Arrow read a paper "On the Laparostict Lamelicorn Coleoptera of Grenada and St. Vincent, West Indies."—Mr. Thomas Harold Taylor, M.A., communicated "Notes on the Habits of *Chironomus (orthocladus) sordidellus*." Mr. F. Du Cane Godman, D.C.L., F.R.S., communicated "Descriptions of some New Species of Erycinidæ."—Mr. W. L. Distant communicated "Additions to the Rhynchotal Fauna of Central America."—Dr. D. Sharp, M.A., F.R.S., read a paper "On the Egg-Cases and Early Stages of some Cassididæ."

October 21st.—The President in the chair.—Mr. Montague Austin Phillips, F.R.G.S., F.R.S., of 22, Petherton Road, Canonbury, N., was elected a Fellow of the Society.—Mr. J. H. Keys sent for exhibition a black variety of *Carabus nemoralis*, Müll., from Dartmoor.—Mr. G. C. Champion exhibited a series of *Rosalia alpina*, Linn., found by himself on old beech trees at Moncayo, North Spain, in July last.—Mr. A. J. Chitty exhibited the larva of *Dytiscus flavescens*, taken at Eastling, Kent.—Col. J. W. Yerbury exhibited *Gastrophilus nasalis*, Linn., taken at Torcross, Devonshire, from the 19th to the 31st of August last. He said that as this rare species differed in a marked degree in its mode of flight, &c., from the common horse bot-fly (*Gastrophilus equi*), it would be as well to draw attention to these differences. *G. equi* when flying round a horse visits, as a rule, the belly and the fore legs. The female carries her ovipositor almost horizontal, and she looks when on the wing like the lower two-thirds of the letter Z (Z). *G. nasalis*, on the other hand, carries the ovipositor tucked under the belly and almost parallel to the axis of the body; this gives her when on the wing a peculiar ball-like appearance; *G. nasalis*, too, always flies to the horse's head. As a rule, the cart-horse under observation paid no attention to *G. equi*, but *G. nasalis* caused it great alarm. The eggs of *G. equi* were in hundreds on the shoulders and fore legs; but although the face and nostrils were searched carefully, no eggs or

larvæ were found thereon. Exhibiting also *Chersodromia hirta*, Walk., he said they were common on the shore near Prawle Point; some were obtained by sweeping over seaweed, while others were running about over the sand. Col. Yerbury also exhibited *Pamponerus germanicus*, Linn., from Barmouth and Portheawl, taken in June. This insect appears to frequent the marram grass on the sandhills, and a female taken at Barmouth 27th June was preying on a beetle.—Mr. A. H. Jones, Mr. H. Rowland-Brown, Dr. T. A. Chapman, and Mr. R. W. Lloyd, exhibited specimens of the genus *Melitæa* from various European localities, and a discussion on the probable affinities of the several named species took place. — The President also exhibited some forms of *Melitæa aurinia* taken by Mr. A. H. Hamm at Basingstoke and elsewhere, and *M. athalia*, *M. didyma*, and *M. phæbe* from Asia Minor and Persia.—The President read, and commented upon, a paper received by him on "Protective Coloration in its relation to Mimicry, Common Warning Colour, and Sexual Selection," by Mr. Abbot H. Thayer.

November 4th.—The President in the chair. — Mr. W. A. Bogue, Wilts and Dorset Bank, Shepton Mallet; Mr. G. R. Baldock, 71, Hertford Road, Lower Edmonton; Mr. Robert Etheridge, Junior, Curator of the Australian Museum, Sydney, New South Wales; Mr. Charles French, F.L.S., Government Entomologist, Victoria, Australia; Mr. J. T. Houghton, Worksop, Notts; Mr. G. Lyell, Junior, Gisborne, Victoria, Australia; and Mr. William Herrod, the Horticultural College, Swanley, Kent, were elected Fellows of the Society.—Mr. H. J. Elwes, F.R.S., exhibited a small collection of North Norwegian butterflies made in July last in one day at Saltdalen, including a fine series of *Erebia disa*, *Pararge mæra*, and *Carterocephalus sylvius*.—Mr. A. J. Chitty exhibited living specimens of *Anthrribus albinus*, showing the way in which this beetle mimics its surroundings.—Mr. J. W. Tutt exhibited a number of series of the genus *Melitæa* to illustrate his remarks made at the last meeting. The discussion on the affinities of the several named species was continued.—Mr. H. J. Elwes mentioned that he was at present engaged in the classification and arrangement of the *Melitæas* and *Argynnis* in the British Museum, and appealed to collectors to bring their series there to be looked over, and to present such specimens as might be useful for the completion of the group. — The President exhibited a set of 323 butterflies from British Guiana, all captured on one day, August 28th, 1903, between the ninth and tenth mile from the Potaro River to the gold-mines. The dominance of the black-hind-winged group was seen in the fact that it included no less than 295 specimens. The *Ithominæ* numbered 389; *Danainæ*, 4; and *Heliconinæ*, 2; a single species, *M. meme*, entirely dominating the group.—Mr. J. C. Kershaw communicated a note on the larva and pupa of *Clerome eumeus*, Drury.—Mr. W. J. Kaye contributed "A Catalogue of the Lepidoptera-Rhopalocera of Trinidad, with an appendix by G. L. Guppy."—Mr. P. I. Lathy, F.Z.S., communicated a paper "On some Aberrations of Lepidoptera." — H. ROWLAND-BROWN, M.A., *Hon. Secretary*.

SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—
October 8th.—The President in the chair. — Mr. F. A. Oldaker

exhibited a series of *Apatura iris*, bred from New Forest larvæ; a series of *Eutricha* (*Gastropacha*) *quercifolia*, bred, from Leatherhead; a series of *Plusia moneta*, bred, from Tilgate Forest; specimens of *Lophopteryx carmelita* and *Agrotis cinerea*, from lamps at Dorking; and a specimen of *Sesia myopiformis*, from Dorking.—Mr. Bishop, a bred series of *Plusia moneta*, from Chinnor, and read notes on their life-history and on the colouring of the cocoons.—Mr. South, (1), a series of *Aglais* (*Vanessa*) *urticæ* he had bred from very young larvæ found on nettle, but which he had afterwards fed on hop; there seemed to be no particular aberrational result, but in three of the specimens the space on the costal area between the first and second black spots were of the ground colour; (2), several specimens of *Cleora glabraria*, bred from New Forest larvæ; one example was very considerably suffused and clouded with blackish; (3), a series of *Acidalia trigeminata*, bred from ova obtained from a female specimen captured at Wisley; a few of the larvæ fed up in 1902, and produced moths in September; the majority hibernated, but from these only two moths resulted in June, 1903.—Mr. Tonge, series of *Conchylis dipoltella* from Brighton, *Crambus alpinellus* from Arundel, five examples of *Senta ulvæ* from near Lowestoft, one *Leucania straminea*, bred from a larva found near Lowestoft on sedge, and a specimen of *L. obsoleta* from the same place.—Mr. Goulton, photographs of the larvæ of *Odontopera bidentata*, *Jocheæra* (*Acronycta*) *alni*, *Hemaris fuciformis*, *Halias prasina*, and *Phorodesma smaragdaria*.—Mr. West (Greenwich), a series of the local Hemipteron, *Aradus depressus*, from Darent, under bark.—Mr. Carr, living specimens of *Acanthosoma tristriata*, beaten from juniper at Salisbury.—Hy. J. TURNER, *Hon. Rep. Sec.*

LANCASHIRE AND CHESHIRE ENTOMOLOGICAL SOCIETY.—The Exhibitional Meeting was held in the Royal Institution, Liverpool, on Monday, Oct. 19th, 1903.—Mr. Wm. Webster, M.R.S.A.I. (St. Helens), in the chair.—The minutes having been confirmed, (Mrs.) F. Eveline Lister, of Bootle, and (Mrs.) Winifred M. Sopp, of Birkdale, were elected members of the Society.—Certain amendments and additions to the rules of the Society having been discussed and adopted, the following amongst other interesting exhibits were examined by the large gathering of members present.—*Aplecta nebulosa* var. *robsoni* from Delamere, by Messrs. R. Tait, Junr. (Manchester), B. H. Crabtree, F.E.S. (Levenshulme), C. F. Johnson (Stockport), and J. Collins (Warrington).—Mr. Tait further exhibited *Agrotis ripæ*, *A. ashworthii*, *A. velligera*, *A. agathina*, *Plusia festuæ*, *Zigana minos*, *Heliothis marginata*, and some remarkably large dark forms of *Acidalia contiguaria* from North Wales, as well as living specimens of *Agrotis ashworthii*, *Aplecta occulta*, and *Acidalia contiguaria*.—Mr. Crabtree's fine series of Lepidoptera bred during 1903 included *Epunda lichenea* and *Eupithecia pulchellata* from North Wales, *E. venosata* var. *hebridum* from Shetland pupæ, *Tæniocampa opima* from Wallasey ova, and *Odontoptera bidentata* ab. *nigra* and varieties of *Abraxas grossulariata* from wild Manchester larvæ.—Mr. Johnson's valuable collection included an exceptionally fine variety of *A. grossulariata*, the ground colour of which, instead of being white, is a dark leaden colour. This insect was bred from a Warrington larva.—Mr. Joseph Collins showed series of *Cucullia*

chamomillæ and *Hydræcia petasitis* bred from wild Warrington larvæ; *Macaria liturata*, including a fair number of the var. *nigrofulvata*, and a collection of Crambidae embracing most of the local Lancashire and Cheshire species.—Mr. F. N. Pierce, F.E.S. (Liverpool), brought a specimen of *Sphinx convolvuli*, captured by Mr. G. Caunt at Wallasey in August last, and Mr. A. Tippins (Liverpool) exhibited *Abraxas grossulariata*, including one magnificent specimen with bright yellow ground colour, bred from a Dingle larva.—Mr. H. B. Prince's (Birkenhead) extensive exhibit included a fine series of *Nemeophila plantaginis* var. *hospita* from the Lake District; and Mr. A. G. Wallington (Warrington) showed *Mamestra abjecta* from Warrington, a species of great rarity in the district.—A collection of some four hundred species of Coleoptera from the immediate neighbourhood of Southport was shown by Dr. G. W. Chaster, M.R.C.S. (Southport), and Mr. E. J. B. Sopp, F.R.Met.S., F.E.S. (Birkdale), which included amongst its many rarities:—*Thinobius brevipeennis*; the very rare *Anisotoma picea*, *A. rugosa*, and *A. furva*; *Heteroceris fuscus*, hitherto recorded from the Isle of Wight only; *Heptaulacus villosus*; *Ammæcius brevis*, an insect entirely confined to the Southport district; *Ægialia rufa*; the very rare *Anthicus bimaculatus* and *Gymnetron collinus*, &c.—Mr. Fred Birch (Wavertree) exhibited living specimens of *Chrysomela cerealis* in all its stages, and gave some interesting details of its life-history.—Mr. H. B. Prince exhibited a living specimen of *Phyllodromia germanica* from Birkenhead, which is considerably darker than the type; Mr. Sopp remarking that he had also lately received for identification the same species from the Borough hospital there.—Mr. Oulton Harrison (Wavertree) showed the *Coccus* (? sp.) commercially known as the "rosy black"; and Mr. W. H. Jennings (Hoylake), samples of liquorice root and coriander seed exhibiting the enormous damage wrought by *Anobium paniceum*, a species of beetle closely allied to the familiar "death watch" of our habitations.—E. J. B. Sopp and F. BIRCH, *Hon. Secretaries*.

MANCHESTER ENTOMOLOGICAL SOCIETY.—The monthly meeting of the Society was held on October 7th, 1903, in the Manchester Museum, Owens College.—In the absence of the President, Mr. W. E. Hoyle, M.A., D.Sc., the chair was occupied by the Vice-President, Mr. B. H. Crabtree, F.E.S.—There was a very good gathering of members.—Mr. J. Leslie H. Atkinson, of Mobberley, was nominated for membership.—Mr. C. F. Johnson gave a few notes on that very interesting family, the Agrotidae; these were overlooked by some beginners on account of the difficulty in naming the species, and their dullness of colour. Mr. Johnson briefly remarked on the British species comprised in the genus *Agrotis* (twenty-two according to South's list). Mr. Johnson's remarks were illustrated by specimens exhibited by Mr. Geo. O. Day, F.E.S., Mr. R. Tait, Jun., and Mr. B. H. Crabtree.—Various other insects were also exhibited.—ROBT. J. WIGELSWORTH, *Hon. Sec.*

BIRMINGHAM ENTOMOLOGICAL SOCIETY.—September 21st, 1903.—Mr. G. T. Bethune-Baker, President, in the chair.—Mr. J. T. Fountain showed a series of *Adopæa actæon*, Rott., taken this year on the south coast; also *Dianthæcia albimacula*, Bkh., *D. cucubali* (S. V.), Fuessl,

and *D. carpophaga*, Bkh., all from the same locality.—Mr. A. D. Imms, a specimen of a *Trichiosoma*, which he said he thought was different from the common *cratagi*, taken in Montgomeryshire.—Mr. Bethune-Baker, a boxful of *Lycenidæ* from Queensland, chiefly species which were associated with ants, and including larvæ, pupæ, and specimens of associated ants in a few cases. He gave some interesting particulars of their life-histories. He also showed a beautiful lot of *Lycenidæ* from Sierra Leone, which he had just received, and which included some new species.

Correction.—In the report of the meeting of this Society on Feb. 16th (Entom. xxxvi. 151), the species of *Ogyris* are spoken of as ant-feeding *Lycenids*. It was not meant to imply that they fed upon ants, only that they lived in association with ants; the loose expression "ant feeding," however, carries a wrong impression.—COLBRAN J. WAINWRIGHT, *Hon. Sec.*

RECENT LITERATURE.

The Butterflies of Switzerland and the Alps of Central Europe. By GEORGE WHEELER, M.A. 8vo, pp. i-vi, 1-162. London: Elliot Stock. 1903.

English collectors of Alpine Rhopalocera have long been feeling acutely the want of a new handbook which should bring together the vast amount of additional knowledge of species, varieties, and localities gathered since the publication of Kane's 'Manual.' Such information, scattered through various periodicals, was difficult of access even in the study, and, of course, never at hand in the field. Mr. Wheeler has given us a handy volume, the product of very considerable labour and large practical experience, which will be welcomed as almost entirely supplying the want. We may safely predict that every one of the annually increasing number of English lepidopterists who collect in Central Europe will carry this new work in pocket or valise. For though Switzerland receives the largest share of attention, the whole of Alpine Central Europe is included in the scope of Mr. Wheeler's excellent work, *i. e.* from the Jura on the north to the Alpes-Maritimes and Basses-Alpes in the south; and from Savoy on the west to Carinthia as far as the Julian Alps on the east of Switzerland. It will be a matter of regret to some that the Black Forest and the Bavarian Alps are not included, which geographically and in fauna seem more akin to Switzerland than, say, the Alps of the Mediterranean. But it would be ungracious to complain at the author's right of choice.

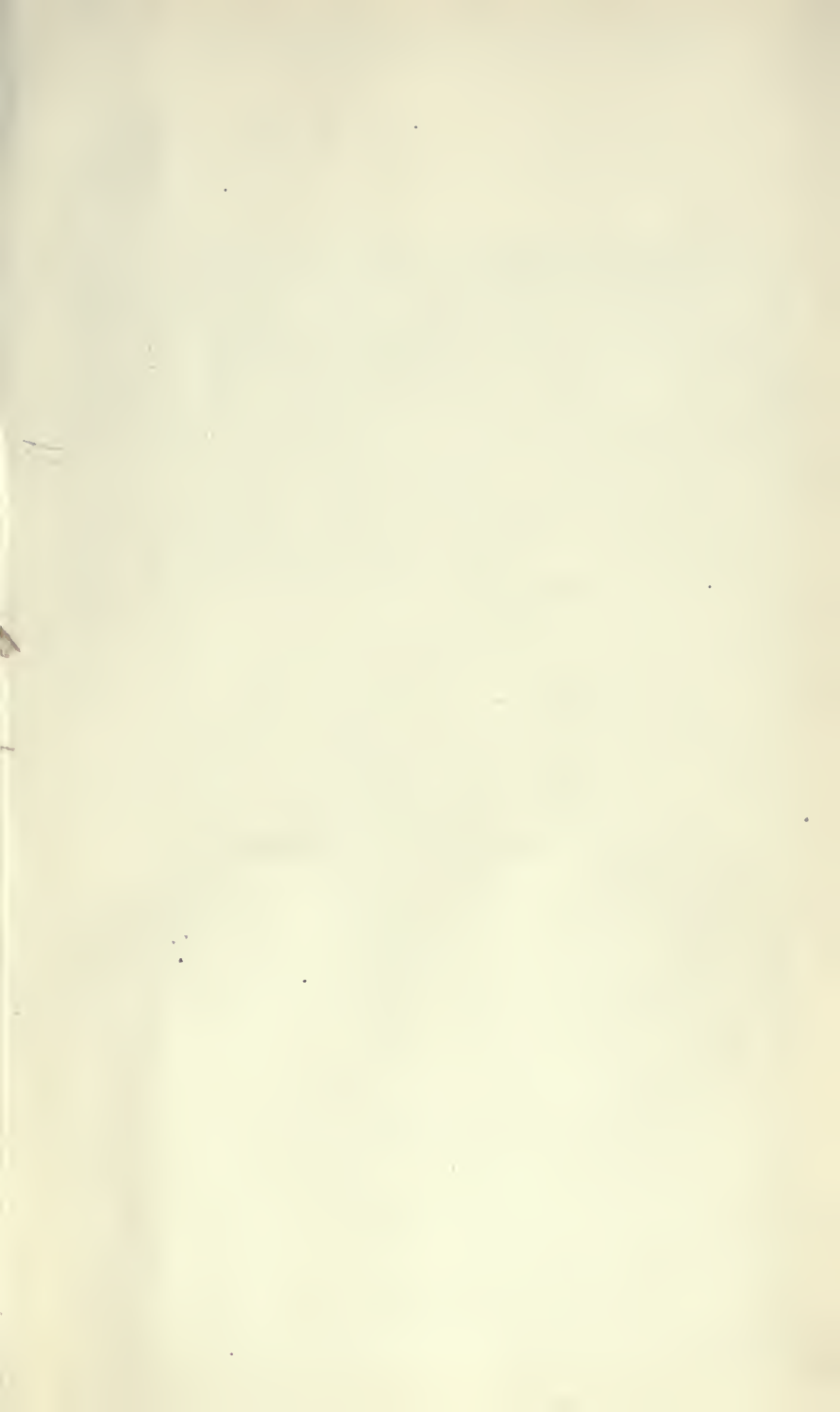
The special features of the work and Mr. Wheeler's aims are clearly and succinctly set forth in the Introduction. It is a pity that the method adopted does not include a description of each species, so that, at least for beginners, some other guide, such as Kane's, is still a necessity. But the prevailing colours of each tribe or genus are given, and often a distinguishing character of the latter; then, under each species, the synonyms, size, food-plant, and the superficial differences between male and female are noted, and one or more characteristics given by which each may be distinguished from its neighbours. These

"distinguishing characteristics" are presented in a novel manner, and form a most valuable aid to the ready identification of specimens, which will be much appreciated. They have been carefully worked out, and are evidently the result of original study (in most cases) of a long series of specimens, and of a habit of minute and accurate observation. Sometimes these "Dist. Char." might perhaps have been made more clear and convincing, if a fuller general description of the species had preceded them. Next follows a list of "localities," which in nearly all instances is very full, precise, and up to date. Under the head "Directions of Variation" we have another excellently performed piece of work, which indirectly, to some extent, makes up for the omission of a full description of the types. Mr. Wheeler has partly avoided the modern craze to exaggerate trifles, and to exalt the inevitable differences between almost every individual of many species to the dignity of named varieties.

His method is to mention the "directions of variation" in colours, markings, &c., and to tell us how each of these culminates in such and such named varieties. Many new and most interesting varieties are described by him for the first time, and many more for the first time in English. Yet among the "blues" we notice at least two omissions which surprise us. Is it possible that the beautiful blue form of female *Rusticus (Lycæna) argus*, L. (*ægon*, Schiff.), known to us as *ab. corsica*, does not occur in the Central Alps? Again, under *Polyommatus (Lycæna) corydon* there is no mention of *corydonius*, unless he has included such forms under *ab. pallida*, Tutt. Mr. F. Rosa mentions *corydonius* from Pfyn, July, 1900 (Entom. xxxv. 96), and other captures have been recorded. The author has always the courage of his opinions, and runs a tilt against one or two notable lepidopterists in the matter of classification and nomenclature. He has abandoned the claim of *berisali*, Rühl (*berisalis*, Fav.), to rank as a species, in favour of making it a variety of *M. deione*, and merged *alcyone*, Schiff. as a var. of *Satyrus hermione*; separated *S. cordula* from *actæa* and *Anthocharis simplonia* from *A. belia*. He also refuses var. *ausonia* a place among the inhabitants of the Valais. Probably it will be proved that he is justified in all these points, but it would have been interesting to have had his reasons for the position he assigns to *Libythea celtis*. We should not have regarded hedges and copses as the haunt of *Neptis lucilla*, but perhaps it is as true as the old superstition of "chestnut forests" being the peculiar habitat of this species. Mr. Wheeler has, however, given us a trustworthy and original book, for the making of which he has had the special qualification afforded by long residence in Switzerland, and the advantage of the friendship and assistance of both English and Swiss entomologists of repute, whose help he most handsomely acknowledges. All collectors will appreciate the "Geographical Index of Localities" with which the book concludes.

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OBITUARY.—We regret to hear that Dr. PHILIP BROOKES MASON, of Burton-on-Trent, died on Nov. 5th last.



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